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GLEANINGS

IN BEE CULTURE

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MEDINA



Root Co.
OHIO

U.S.A.

Western Edition.

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Untested	\$ 75	\$ 8 50	\$ 35 00	\$ 65 00
Select Untested....	1 00	11 50	47 50	77 50
Tested	1 50	17 00	70 00	130 00
Select Tested	2 50	28 50	—	—

Untested	\$ 1 00
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Best Imported.....	\$5 00	Fair Imported.....	\$3 00
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We are prepared to furnish one, two, and three-frame nuclei, and full colonies of bees in eight-frame Dovetailed hives or Danzenbaker hives. The nuclei are put up in light shipping-boxes made of basswood, the sides of which are only $\frac{5}{16}$ inch thick, and the ends $\frac{1}{2}$ inch. The top and bottom are covered with wire cloth. This makes a very light package, affords plenty of ventilation, and is strong enough to stand shipping 500 to 1000 miles.

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One-frame nucleus, without queen,	\$2 00
Two-frame " " "	3 00
Three-frame " " "	8 50
Full colony in eight frame Dovetailed hive.....	7 50

We can furnish with the nuclei any queen mentioned in the table of prices of queens.

Cincinnati, Ohio, Wharton, Tex., St. Paul, Minn.,
Medina, Ohio, Philadelphia, Pa., High Hill, Mo., Augusta, Kans.

This will give you low Express Rates.

Gleanings in Bee Culture one year, and one un-
tested Italian queen from our Southern yards..... **\$1.00**

We begin shipping at once. Orders filled in rotation. Do not ask for special arrangements; at this low price we can not make exceptions. Gleanings in Bee Culture one year, and one untested Red clover queen..... **\$1.50**

We begin shipping these queens about April 15. Orders filled in rotation.

We agree to deliver queens in good order to any part of the United States or Canada, from April 15 to October. In case of queens valued at \$5 or more, we ship in a one-frame nucleus (no charge for nucleus). If a two or three-frame is wanted, add to the price of the queen the difference in price between a one-frame and the two or three-frame. Losses must be reported on arrival.

This contains a frame partly filled with brood and bees. The conditions of the hives at different seasons of the year vary so that we can not always put up nuclei in the same way; but in every case we aim to give full value. Weight, about 7 lbs.

This is just the same as our one-frame nucleus, except it has twice the amount of bees or brood, or of both. The box is larger, and holds two frames—one full frame of brood, or two partly filled. Shipping weight, about 10 lbs.

This is three times the size of the one-frame nucleus, and is made up in the same way as the one and two-frame. Shipping weight, about 15 lbs.

This will contain 8 Langstroth frames in Dove-tailed one-story hive—three full frames of brood, or equivalent, in six combs, and bees enough to cover fairly all the combs. No queen is furnished at the table price. Purchaser is to select the queen and add her price to that of the bees. Our colonies are all put up in new Dove-tailed or Danzenbaker hives, painted two coats. Shipping weight, about 40 lbs.

The A. I. ROOT COMPANY,

==== Main Office and Works, MEDINA, OHIO.====

GLEANINGS

A JOURNAL DEVOTED
TO BEES,
AND HONEY,
AND HOME
INTERESTS.

BEE CULTURE

ILLUSTRATED
SEMI-MONTHLY
Published by THE A. R. ROOY CO.
\$1.00 PER YEAR MEDINA, OHIO.

Vol. XXXII.

APR. 1, 1904.

No. 7



I VOTE for bees with stings, if the thing is ever settled by vote.

EXCLUDERS are not necessary to keep the queen out of section supers, if sections are filled with foundation. If you use little starters in sections, it may pay you to use excluders.

ALLOW me to supplement the excellent advice of friend Doolittle, p. 274, by advising Mr. Jones to plant also cherries and plums for their excellent service before apples bloom.

LET ME ADVISE bee-keepers, especially the younger ones, not to omit reading such articles as that by E. F. Phillips, p. 285. A substantial foundation of the right kind of theory may be worth more than you suppose in your future practice.

I AM SURPRISED that sweet clover does not flourish about Borodino in muck and hardpan soil. It does here. Hardpan from the bottom of the cellar, in which nothing else cares to grow, seems just to suit sweet clover. How is it about Medina? [Here too.—Ed.]

R. A. WHITFIELD, I'll tell you another thing that'll happen to you if you put brood over your sections: The bees will seal the sections more or less dark with bits of black comb brought down from above. They did for me. P. 288. [Yes, that is our experience also.—Ed.]

DISCUSSION at Colorado convention (*American Bee Journal*, 135) shows considerable inclination to return to selling by weight instead of by case, although, with the limits placed, their present method is nearly by weight; indeed, Mr. Aikin said, in convention, "In fact, we are selling by weight."

THE QUEEN "takes several small preparatory flights," page 286. Are they really preparatory, or only unsuccessful? Is not the first flight often if not usually successful? [Possibly both. It is natural to suppose, however, that the queen goes out into the air for one purpose only; and, failing to accomplish that purpose, she makes other flights until successful.—Ed.]

MR. E. W. ALEXANDER, in Eastern New York, tells in *Review* that with 300 colonies in one yard, colonies on scales showed a gain of 10 to 18 lbs. a day. Last summer he had about 700 colonies in the home apiary, and intends to have many more this summer. Is it possible that Coggshall and others are foolish to keep little bunches of 50 or 100 colonies five or ten miles off that might be kept at home just as well?

I EXPECTED to hear that you were using electricity to heat a wire when cutting candied honey, p. 276; but I expected also that you would be using a full set of wires at a time instead of a single wire; then one cut in three different directions would leave your can of honey in cubes. [One wire will cut the cakes fast enough. Three or four wires could not be used. Sometimes the wires stretch; sometimes there is a soft streak, and the same pull on all four wires would not give satisfactory results. It is a little trick to cut with even one wire.—Ed.]

THE CHANTRY introducing-cage has been sent me by E. F. Atwater, who has used it with great success. Its construction is based on the idea that strange bees will not molest a queen while both are in a cage. A short candied passage admits the bees to the queen in a few hours. Instead of pasteboard on the outside of this candy is a piece of excluder, so that the bees may freely pass in and out, leaving the queen still a prisoner for perhaps two days more, while the bees eat the candy out of another passage $2\frac{1}{2}$ inches long. Now, why isn't that all right?

SPEAKING of the fertilization of the egg, E. F. Phillips says, p. 286, "If it is to be a worker egg it receives from the spermatheca one spermatozoon." I suppose that

italicized "one" means "only one." I think Von Siebold was the first to discover spermatozoa in bees' eggs, "and in each of thirty, out of forty, of his prepared female eggs, he found from one to five spermatozoa." See *American Bee Journal* for 1861, p. 125. [This is respectfully referred to Mr. Phillips, although I am satisfied he was fully cognizant of this statement, and was probably in possession of later evidence of a more conclusive character on which he based his statement in question.—Ed.]

GLEANINGS seems to favor putting bees part in cellar and part out, p. 275. Good thing to experiment that way to find out which is best; but I suspect that, when Doolittle settles to a dead certainty which way averages the best in a series of years, he'll use only that best way. [Yes, probably. Possibly Doolittle's locality is of such a nature that it is best to "put his eggs in two baskets." But there are some localities where, certainly, outdoor wintering would give much better results in a period of ten years; and it is equally true that there are other localities where the indoor plan for the same time would show the least loss.—Ed.]

A FRIEND wants to know about my trying the Hershiser plan last summer. I did not try it on a large scale; but when, in the flush of the harvest, I put the empty super on top, there was extra waste in the way of burr-combs in the nearly finished supers below, and the case was aggravated if only two supers were allowed. I think I should have lost several hundred dollars if I had submitted all to the same treatment. With weak colonies, or in poor flows, it is all right. [Our season for comb honey, at least last year, was almost a failure, and we were not, therefore, able to come to any conclusion with regard to the Hershiser plan of tiering over rather than tiering under; but it is easy to see that for you at least it was more feasible to tier under—that is, putting an empty super under one partly filled—than putting the empty on top.—Ed.]

L. H. CREMERS says (*American Bee Journal*, p. 189) that buckling of foundation is because foundation expands with heat and contracts with cold, so when foundation that was wired cold is put into a hive, the expanding makes it bag. He puts in wire and fastens foundation to top-bar in winter, then in summer he imbeds the wire in a very warm place and immediately puts it into the hive. [There may possibly be something in this. Our foundation has nearly always been imbedded within at least a week before the time it was given to the bees. As we have had very little trouble from buckling, this may account for the fact. I should like to hear from others on this point. I might add further that, when we put in foundation, the pile is always warmed up by being set in a window where the sun shines. The foundation is imbedded when the sheet is warm; and very often

it is put into the hive as fast as it is imbedded.—Ed.]

IF THE RAILROADS keep on they will soon put out of business the Prohibitionists, Anti-saloon Leagues, etc. "The general rules against intoxicants that are now enforced on all railroads," says a Chicago daily, "have, up to this time, applied only to the employees of the train and operating departments. Now the St. Louis and San Francisco and the Chicago and Eastern Illinois roads have determined no longer to allow expense accounts for wine feasts among traveling, district, and general agents." [But the Prohibitionists and the Anti-saloon League have been keeping up the agitation that makes all these progressive moves possible. There is nothing the saloon men fear more than agitation and a good airing. They love darkness rather than light. As long as their deeds can be held under cover, so long will they continue to rob our boys of this life and the one to come.—Ed.]

WE ARE TOLD, p. 293, that few city customers "who have ever tried genuine buckwheat honey would be willing to exchange it for the finest grade of white clover." Now, what under the sun made the *Country Gentleman* print such nonsense as that? Yes, I know that some people very much prefer buckwheat or other dark honey, but the great majority, city or country, much prefer the taste of the light honeys. [If you were to stay a few weeks in the locality where the *Country Gentleman* is published (Albany, N. Y.), and talk with consumers, you would possibly, from their testimony, think there was no honey in the world that was pure and good but buckwheat. The *Country Gentleman* was evidently basing its statement on the current belief and preference in its own immediate locality; and its statement, when confined to that locality, is not far wrong.—Ed.]

THE OFFICIAL REPORT of the committee of the insurance companies says that the great Baltimore fire was started by the dropping of a match, or a lighted cigar or cigarette thrown down through a broken deadlight in the pavement above the basement of the Hurst building, falling upon some inflammable material. If the city had had an ordinance forbidding smoking on the streets, it would have been in the interest of common decency, and, incidentally, a saving of some millions. Just now Chicago is having a lively time making arrests for spitting on the streets. Why not make smoking go with spitting? [It would not be practicable, because public sentiment would not favor putting the two on the same plane. Spitting on the sidewalk is repulsive to every one. There is no lobby that would dare to go into a legislature and argue that spitting on the sidewalk is a good thing. It is easy to pass laws against bad things when every one is in favor of abolishing the thing that ought to be effaced by law; but if we were to take a poll of a vote as to

whether smoking should be allowed on the streets or not, I think you would find there is almost as large a majority in favor of it as there would be a majority against spitting. That is not saying, however, that majorities are always right.—ED.]

IN BAVARIA a man named Hofman put a dish of poison out in his apiary in order to destroy the neighboring bees that were bothering him. He shut up his own bees meanwhile for safety. The experiment was a grand success, for in a short time eight of the neighboring colonies were destroyed. The injured parties rushed into the yard, found the poison, proved the identity of that and that in the dead bees, and brought him to trial, where he was fined \$75 and costs.

W. H. LAWS (*Review*) uses 100 to 150 bees, never more than 200, in his queen-fertilizing nuclei. He keeps no *permanent* nuclei. Two little trays, $\frac{3}{4}$ inch deep, $11\frac{1}{4}$ inches long, and $4\frac{1}{4}$ wide, hinged at the bottom with leather strips, clamp tightly between them a frame of the same dimensions containing a comb of solid honey. A five-sixteenths bit bores an entrance in the end-bar, near the bottom. In this the queenless bees, filled with honey, are fastened; and when they begin roaring, the virgin is run in the entrance and the entrance closed. After a confinement of 24 hours or more the entrance is opened, and a virgin of right age will be fertilized within 24 hours, when excluder zinc prevents the escape of the queen. When she lays, all are emptied out, and a *fresh* lot of bees given with another virgin. [Mr. Laws and Mr. Pratt can probably make these small nuclei work; but the average person will probably make a failure of it. The Laws plan, however, is as practicable as any thing I have seen in print.—ED.]

E. F. ATWATER has a simpler and better hive-stand than mine, as I mentioned on p. 115. He writes me: "The funny part of it is that, since 1898, I have used that kind, and, until 1902, I thought I was using the Dr. Miller stand pure and simple. I must have misunderstood your directions for making them." The question is: Am I to be condemned for handling the English language so bunglingly as to be misunderstood, or commended for securing thereby a better stand? [Your language was plain enough, I think; for when I first saw your description I pictured out in my mind just the hive-stand you are using. But I agree with you that friend Atwater has improved it by nailing the boards the other way, so that the edges, not the sides, rest on the ground. We have many hundreds of such stands in use for single hives. They have the advantage that the sharp edge will imbed itself into the inequalities of the ground if the stands are set out in the early spring when the ground is soft. The flat board edges would not so adjust themselves. I am inclined to think that you would throw away your hive-stand if you would once try the Atwater improvement.—ED.]

So YOU THINK, Mr. Editor, that I'm a firm believer in some form of ventilation in cellar, p. 285. That hardly expresses it strong enough. Every year its importance grows on me. During most of the past winter one of the outside cellar doors $6 \times 2\frac{1}{2}$ has stood wide open day and night, except for a screen of wire cloth, and the door from the outer room to the bee-room stood open all the time, and I'm pretty well convinced that they *didn't have enough ventilation*. The room was too crowded. "How do I know?" Well, one way I know is that the bees nearest the inner door, the ones that had the first chance at the air, kept the quietest in the cellar. This in spite of the fact they had the most light—more light than I think was good for them. Yes, sir; give me lots of air, both for folks and bees. [Our experience for the last two years has been emphatically in favor of ventilation; and I can not understand *why* there should be some good authorities who favor little or no ventilation. Perhaps they are deceived. Possibly much more air gets through the walls of their repositories than they suppose. Bees are almost as highly organized as human beings. In summer they require a great deal of air, just as we do. Cut off our ventilation, and what is the result? Disease and death. I believe the average beginner, at least, will be more successful if he gives the bees air than if he withholds it from them by keeping the repository closed tight.—ED.]

SOME TIME AGO, when it was argued that I would have brood to top-bar because splints didn't allow sagging, and sagging prevented queen laying up to top-bar at Medina, the editor said measuring showed there was no sagging there. A correspondent reminds me of this, and asks me to reconcile it with the position the editor now takes, that wires must be loose to allow sagging. Which goes to show how villainously inclined some people are to want to put a load like that on my shoulders when I'm not over-strong at best. [If there is such conflict (and I assume there is), it is due to the lapse of time and a change of conditions, not because I have necessarily changed my opinion. As years go on, there is a tendency toward a thinner and thinner foundation in the brood-nest. The brood-combs examined were probably built off from foundation made some years ago, when fewer sheets per pound were used than now, and in consequence there would be less tendency to sag. I remember the circumstances, and recall that they were taken at random from those we had had in use for a number of years. If you will compare the foundation-lists you will find there are more sheets of foundation per pound than there used to be for the same grade; and it is, therefore, necessary to provide for possible sagging, under some conditions at least. Now, after saying this much I am free to admit your splints would allow a lighter grade of foundation than our horizontal supports.—ED.]



Mr. Villuendas Herrero will be the future editor of our esteemed Spanish exchange, *El Colmenero Espanol*, whose editor died last December. He is well recommended.

In speaking of cheap insurance among bee-keepers in Germany and Austria, I said it was about 8 cents per colony. Dr. Miller sends me a clipping showing it is 8 cents per bee-keeper, without reference to the number of colonies he has. So much the better.

About eight bee-journals are published in Russia, most of which we expect to get on exchange. Mr. Abram E. Titoff, of this office, will have them for review. He is a native Russian, and the only man I know who can read and translate that difficult language for us. Mr. Titoff is a well-informed bee man, and has already given us some good hints.

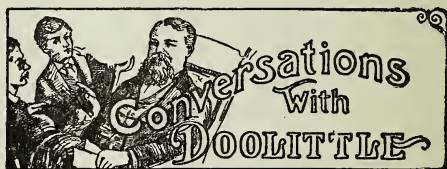
The question of the legal prohibition of artificial honey having been brought up before the German Reichstag (Congress), it led the minister, Count Posadowsky, to make the following declaration:

I well know that much is eaten for honey that is not honey; and all those who eat honey at a hotel in Switzerland or elsewhere would be very wrong in supposing that it is by any means the natural product. One day in the federal council we had two samples of honey brought to us—natural and artificial. It was impossible to distinguish one from the other, for as yet there is no means for doing it by chemical analysis. The honey from Havana is entirely different from that of Lunenburg. When the day comes that will enable us to distinguish natural from artificial honey, the law will take hold of the matter.

The March issue of the *Bee-keeper's Review* is a beauty, and a decided improvement over any I have yet seen, on account of a better style of headings. Mr. Hutchinson has discarded the cumbersome and costly style he has long used, and now I do not see how he could make his pages more beautiful so far as type is concerned. The contents, too, of this number are of unusual interest and usefulness, taking in a wide range of practical topics. Mr. Hutchinson is a voluminous editorial writer, a large proportion of his journal being from his own pen. That alone is praise enough; but the kindly tone that has always pervaded his paragraphs is very commendable.

The *Pfalz Bienenzeitung* says the ancient bee-keepers of Egypt were in the habit of putting their bees on boats in October, and

descending the Nile slowly, stopping here and there in order to allow the bees to gather nectar in that spot. On page 83, 1889, I gave an article, with illustration, showing how this is done even now. But the idea is not peculiar to the Egyptians. *L'Apiculteur*, one of our best French exchanges, says, "There is nothing new under the sun. The Russians have copied the Egyptians. Some boats, carrying a garden of honey bearing plants, forming a veritable apicultural garden, descend the large rivers of Russia, explaining to the people along the shore the benefits of apiculture. We are informed that the Russians employ the same process to popularize new methods in fruit culture." There is a decidedly poetic aspect to that phase of bee-keeping. No valid argument could be raised against movable frames in that case, as the whole business would be a moving spectacle. It is to be suspected, however, that constant governmental interruption in Russia would make the work rather disagreeable. That method seems to be entirely out of vogue in the United States.



SETTING BEES FROM THE CELLAR.

"Good morning, Mr. Doolittle. This is a fine morning."

"Yes, Mr. Barker. And it seems nice to have a little something springlike, after the long cold winter we have had."

"Yes. And this nice morning made me think that it would soon be time to get the bees from the cellar, and I came over to have a little talk with you in regard to the matter. When should I set them out, and how should I do it? This is the first time I ever tried wintering bees in the cellar, so I am 'green' in this matter of setting out."

"As to time of setting out, there seems to be a difference of opinion among our best apiarists. Some think that, by setting bees out early in March, when the first warm days come, they will raise young bees in sufficient numbers to take the place of the old bees that are lost and worn out of old age later on, when they commence to gather pollen, so that, in case of early setting out, there is little or no spring dwindling."

"Well, that looks a little reasonable. But what about those who do not agree?"

"Other good bee-keepers are equally positive that bees should in no case be set from the cellar till steady warm weather is likely to occur, giving the time for settled warm weather as commencing with the blooming of the elm and soft maples. These last argue that, with the warm weather, each old

bee will nurse and bring on to the stage of action from two to five young bees, hence there will be no spring dwindling, but, instead, a hive full of bees' prepared for an early honey harvest, which could not be the case where bees are set out early, and using all their vital energies to keep the cluster warm enough to nurse a little brood, which will not mature nearly fast enough to supply the waste of old bees which are lost in the cool weather of early spring, in their vain search for water, pollen, and early flowers."

"Well, that sounds as reasonable as the other, except the water part. I should suppose there would be more water at this time of the year than at any other."

"They do not argue that there is any scarcity of water at this time of the year, but that the bees in going for it perish by the thousands in becoming chilled and benumbed by clouds passing over the sun while they are taking their load of cold water, or by their getting into the water and immediately chilling to death in their benumbed condition."

"What shall I do where there is such a disagreement as this? Which shall I follow?"

"My way of arriving at a conclusion in such a case as this has been to set a few colonies out as early as days sufficiently warm occur, the latter part of March, and then set out a few at a time on each occurring warm day, till pollen becomes plentiful from the soft maple and elm, at which time all agree that the bees should be on their summer stands. Of course, such setting out as this can apply only to the home yard; for when we go to the out-apiary it is a matter of economy to set all out on the day we are there."

"Did you arrive at any definite conclusion in the matter, so you are positive which is best?"

"Well, no, not exactly. Very much depends upon the way the season turns. Some years the bees early set out seem to do the best; other years those set out late have a decided advantage. One year I did not set out the larger part of the bees till the elm and soft maple were past their height of bloom, and witnessed something I never saw before, which was, bees by the hundreds coming in loaded with bright red and yellow pollen, within half an hour after the colonies were placed on their summer stands. That it was possible for one old bee to be the means of placing on the stage of action five bees to take the place of itself, was apparently proven that year; for, within 30 to 35 days from the time of setting out, many of these colonies were nearly or quite ready to swarm, and not one colony showed any signs of spring dwindling. Within 21 days from time of setting out, nearly every comb in the hive was filled with brood, and so perfectly solid that, when the young bees began to emerge, the hives were filled to overflowing in a few days."

"Then you would rather favor the plan of late setting out?"

"To tell the matter just as it is, I am generally from ten days to three weeks in getting my bees out, and in this way I am quite sure of a full success with a part of them, no matter how the season turns. Long ago I came to the conclusion that it was not wise to have all of the eggs in one basket."

"I think I will try the slow-setting-out plan with mine, as there certainly can be no great loss by this way. Now how is the setting-out done?"

"At the out-apiary I always have a man help me, and we put a rope under the cleats of each hive, when he takes hold of one end or loop of the rope and I the other, and we carry them out without jar, and set them on the stands as quickly as may be so as to get all out to have the benefit of the mid-day sun."

"But I have no man with me; and to hire one for the setting-out of only a few at a time would be a sort of nuisance. How do you work at home?"

"I take my wheelbarrow, and on it spread several thicknesses of old carpet, or something of that sort. Two horse-blankets folded so as to be the size of the bottom of the wheelbarrow are about the best of any thing."

"What do you do this for?"

"This is to take off any jar that may come from the wheel to the barrow going over rough ground; for in moving bees it is always best to arouse them as little as possible. I now start a fire in my smoker, and with the two go to the cellar door, where I leave both and go in and bring out a colony, placing it on the blankets on the wheelbarrow. As soon as this is done I raise the front of the hive a little and blow in two or three puffs of smoke, which keeps the bees from coming out and getting lost on the way to their stands, and also from their stinging me, which those which fly out, where no smoke is used, are quite sure to try to do."

"I am glad you told me of that, for I should not have thought of their coming out and stinging, nor of their getting lost. But go on."

"As soon as the smoke is puffed into the hive the cellar door is shut so that the outside air shall not raise the temperature of the cellar, and thus arouse the bees inside, when the hive is wheeled to where it is to stand during the summer, the entrance adjusted, and the whole left as they are to stand thereafter."

"Do you take pains to put each colony back on the stand it occupied the previous season?"

"No. I know that some think that this should be done. But in setting out I always scatter the hives about, one here and another there, as far apart as possible at the first setting-out, then at the next setting-out fill in between, so that no two colonies will be in full flight at the same time."

This nearly or entirely prevents all mixing of bees, so that one colony is no stronger in bees, nor weaker, than it was when in the cellar. Some think that each colony should be set on its old stand of the fall before, as I just said; and where colonies stand close together, and are set out all at once, so that many colonies standing side by side are in full flight at the same time, I think it would be well to set them on their old stands. But with my plan of setting out, all this inconvenience is avoided."

"Thank you. I will be going now, as I see by the sun it is nearly noon."



THERE ought to be a heavy demand for bees this spring in the form of nuclei and colonies. Queen-breeders will do well to cater to this trade. We believe there is good money in it.

THE failure of the honey-crop in California and Cuba, and the heavy winter losses in the lake regions in the northern parts of the United States, ought to have a toning effect on the market for new honey.

ONE of the finest honey confections is solid candied honey, cut into cubes about an inch square, dipped into hot chocolate. As chocolate will keep these in good condition, there is no reason in the world why such confectionery should not have a good and permanent demand. Already one of our subscribers is making this wire cutting a success, and he reports that the product moves off readily. It is something new and nice.

THE RELATION OF BEES TO FRUIT-GROWING.

THIS is the title of an address delivered by Mr. Wilmon Newell before the Georgia State Horticultural Society last August. It seems to be the most thorough treatise on this subject yet published. As any thing like a condensed review of it would be out of question here, and as the whole pamphlet can doubtless be had by asking for it, we will simply give two of Mr. Newell's most important propositions: 1. Insects are essential for the pollination of fruit-bloom; and the honey-bee does this more thoroughly than any other insect; 2. Bees take part in disseminating pear-blight and brown rot, but these would be practically as prevalent, even though there were no bees.

THE OHIO FOUL-BROOD BILL.

THE Ohio foul-brood bill is still hanging fire in the legislature. It seems that, after it passed the House, and was in the hands

of the committee of the Senate, it was discovered there was one little feature of it that was unconstitutional, otherwise it would have passed the Senate. From the latest advices the bill had gone back to the House, with the probability that it would pass. The bee-keepers of the State sent such a fusillade of letters into the Senate that the measure is quite sure to pass that body. Those who are back of the bill are "standing pat," awaiting developments with the confident assurance that the measure will become a law as soon as the necessary proceedings have been gone through with.

FREE-HANGING VS. SELF-SPACING FRAMES.

IN the Question-box department of the *American Bee Journal*, in which the opinion of some thirty or more different bee-keepers have been called for, the question is asked, "If you were starting anew, would you use a free hanging frame? and if so, why?" The opinion seems to be about evenly divided between the loose unspaced and the self-spacing frame in a way that would almost seem as if the latter type of frame were not as popular as one would naturally suppose. But if this same question had been asked some twenty years ago the answers from almost these same people would have been almost unanimously against the self-spacing frame in any of its forms. The tide seems to be turning. If the reader could look over our order-books he would be surprised to see that the automatic spacer in some of its forms is called for nearly ninety-nine times as often as the unspaced, and we sell different styles of them.

Some have imagined that the self-spacer frame was not practical for extracted honey; but there are some large producers who do use them, and will have no others, and this seems to indicate they can be used successfully too. The notion that a Hoffman, for extracting, can't be spaced wide to get thick combs is wholly wrong, as I know by personal observation in some large apiaries of men whose colonies run over the thousand mark. In Cuba, for example, where we tried to push the unspaced frame, and where there is more extracted honey produced per square mile than anywhere else on the globe, the Hoffman self-spacer is used almost exclusively.

Of course, to the manufacturer it makes no difference which frame (spaced or unspaced) is sold or preferred, for there is just as much profit in the sale of the one as the other.

WINTER LOSSES UP TO DATE VERY SEVERE IN THE LAKE REGIONS.

ON p. 277 of our previous issue I gave a summary of the hundreds and hundreds of reports that had been received from all sections of the country within a radius of a thousand miles of Medina. More reports have come in, largely confirming those first received—namely, that the winter losses for outdoor bees (not indoor) have been excep-

tionally heavy — probably the heaviest for over twenty years. The losses for the various States stand about the same as those indicated in our last issue, *except* that Michigan now appears to have suffered the most. Next come Ohio, New York, Pennsylvania, Wisconsin, Indiana. Strangely enough, no severe losses are reported in Illinois and Iowa. The States suffering the most are those bordering on the great lakes; and the one almost entirely surrounded (Michigan) appears to have lost the most bees. The reports go to show further that there are very few losses in any of the districts where the bees were wintered *indoors*.

Outside of these lake States the losses have been comparatively light except along the Atlantic coast and in a few scattering localities in New England. It appears that the matter of humidity as well as cold has something to do with the severe losses among the outdoor bees.

In nearly all the Western States, and all the States south of the Ohio River, the bees have wintered well. In Colorado and Idaho, where it is as cold as or colder than the lake regions, the losses appear to be very light.

We have received scarcely any reports from Canada. This seems to indicate that the majority of bee-keepers there winter indoors.

I should be glad to have our subscribers continue to send in reports; but let them be confined to *postal cards*, and to *two or three sentences*. It takes a great deal of time to read through and summarize so many letters, and long ones have to be passed over. Confine the statements to three facts: 1. The approximate losses for your locality, so far as you can gather; 2. Whether these losses relate to indoor or outdoor bees; and, 3. The character of the spring—whether favorable or otherwise.

HONEY FROM CORN; ROCKEFELLER SAID TO BE IN A NEW SPECULATION.

The article below is going the rounds of the papers.

JOHN D. ROCKEFELLER IS MAKING HONEY.

NOT THE REAL ARTICLE, BUT A CLEVER SUBSTITUTE MADE FROM CORN JUICE.

John D. Rockefeller now makes artificial honey with as much enthusiasm as he formerly pumped petroleum out of the ground years ago. He puts corn into water, and boils it with a little sulphuric acid. Then he puts in some lime to neutralize the acid. This forms a precipitate of sulphate of lime. He separates the sulphate from the corn juice by running the mixture through a filter press. The result is crude glucose, which so resembles real honey in flavor and color that it takes an expert to distinguish it from the genuine product.

There is one objection to the glucose honey. It retains, no matter how much it is refined, a certain trace of the sulphuric acid. Commission men say they can taste the acid. Chemists declare that the acid rots the teeth. In another generation or two, from this cause alone, they contend, there will be hardly a child with sound teeth.

Mr. Rockefeller is doing his best to get rid of the sulphuric acid. He has offered, it is said, \$500,000 to any chemist who can produce glucose from corn as cheaply as by his present process, without the use of sulphuric acid, or, at least, without having the slightest sulphuric acid in the corn juice.

The crude glucose Mr. Rockefeller dilutes with real honey, puts up in nice looking glass jars with fancy labels, and sends all over the world. Grocers sell it to the unsuspecting public, and little children eat it with delight.

The crude glucose is used in tremendous quantities to adulterate molasses. There is very little pure molasses in the market since Mr. Rockefeller got into the glucose business. Corn juice is very much cheaper than cane juice.

To refine glucose Mr. Rockefeller has it poured into big vats, whence it passes through a charred bone dust, and comes out as a colorless sticky liquid, like glycerine, which is growing more popular every day with bakers and confectioners. They buy it from Mr. Rockefeller in carload lots, and use it for cheap candy and icings.

Mr. Rockefeller expects to make a million tons of glucose next year or the year after. Some of the distillers say if he keeps on at this rate there will soon be no corn left for whisky.

The above has been sent us several times. It is the best kind of campaign document. Let it go the rounds of the press. Of course, it is a sensational article written by some reporter who wants to create a stir. A little examination will show that the article is self-contradictory. In the first paragraph we are told that it takes an expert to tell it from real honey. In the second we are told that no amount of refining removes the taste of sulphuric acid. So far as resembling honey is concerned, unless genuine honey is mixed with it there is no similarity. The only thing the honey-men have to be troubled about is that a good many may use this corn syrup instead of honey because it is so much cheaper; but I have not seen any yet that can be compared with good honey; and if it transpires that it is injurious to the health, teeth, etc., we have not much to fear. The statement that Mr. Rockefeller is offering half a million dollars to any one who will get out the sulphuric-taste is rather significant if true; in fact, it is a big advertisement for real honey.

Finally, I can not discover that Mr. Rockefeller, or whoever the vendor of the stuff is, has ever called it honey at all. If our pure-food laws are enforced so that the label on the bottle tells exactly how much corn syrup is contained in the article offered for sale we have not much to fear. The people who buy cheap candies and syrups, however, have a good deal to fear until somebody claims that half-million of dollars.

Many of our friends have become alarmed for fear this product would affect seriously the retail honey business. It may do so to some slight extent at first; but we have very little to fear from it. The taste of the stuff for the first time may not be unpleasant; but a regular diet of it would soon disgust the consumer, for sulphuric acid is not a palatable food. Honey has long been known to be the best and purest sweet, and no flash-in-the-pan advertising is going to destroy its reputation that has *been building up for centuries*. Corn syrup is known as *glucose* pure and simple. It would take more money in advertising than Rockefeller has, to make consumers generally believe that glucose is "better than honey" if it is "cheaper." The fact is, the brassy sulphuric-acid taste in glucose can't be eliminated without making it too expensive.



THE BEE-KEEPER VS. THE ALFALFA-GROWER OF NEVADA.

Why the Bee Does Not Lessen the Quantity and Quality of the Hay.

BY D. T. MEACHAM.

On p. 917 is an article in reference to serious trouble in Nevada growing out of a spirit of jealousy and selfishness on the part of alfalfa-growers toward bee-keepers whose bees gather honey from the blooms of the alfalfa or lucern clover. Nothing but the grossest ignorance could possibly claim that the bees saving the honey could in any way injure the value or decrease the crop of forage. As there are so few people who know what honey really is, and how it is produced, I have concluded, by your permission, to explain as briefly as space will allow what honey is and how it is formed, and what purpose it serves in nature.

In the first place, it is a waste product in the vegetable kingdom, gathered by only a few species of insects, the most important of which is the honey-bee, as well as the most abundant. Honey may be closely imitated, but can never be made as perfect by man as it is when gathered by the bees from the flowers and leaves. Our great and good Father appears to have created bees for this specific purpose. The honey partakes of the flavor of the oil that may be extracted from the seed of the plant or tree producing the flowers. Plants that yield no seed never yield any surplus sugar, or honey, in their flowers. But I am drifting away from the object I have in view, and I must return to the theme above announced.

"How is honey produced?" is the first question we propose to answer; that done, and no sane person can claim that bees gathering it from the flowers of plants or the leaves of forest-trees either injure the plant or reduce its weight when matured. In explaining the process as worked out in nature we must invade the field of science, and learn from the chemist and vegetable physiology what they have seen of the subject in the great laboratory of nature.

Plants and forest-trees, as well as all fruit-trees, are compound objects, consisting of roots, bark, and leaves, all of which have their particular functions to perform. In this article we shall confine ourselves to the leaves and flowers. We have all seen that leaves hang on to the trees and plants long after they are fully grown. Why is this? What are they doing? The function of the leaves is to gather or assimilate carbon from the surrounding air, in the form of

carbonic-acid gas, which, under the influence of sunlight, is transformed into starch. This starch is stored in the body of forest and fruit trees for the purpose of supporting the next season's growth of wood and seed. At the proper season, and under the influence of proper temperature, another substance, known to the chemist as diastase, makes its appearance in these starch grains, and a new transformation takes place, whereby the starch is changed into sugar, then into gum, then into wood.

We said that honey is a waste product from nature's great laboratory, gathered and saved by the honey-bees. This starch, after being changed into sugar, is used by the plant to feed and support new growth and the seed; and whenever and wherever there remains an excess after supplying the newly formed leaves and seed-stem, etc., it is discharged in the form of a syrup on the leaves of certain trees, and on the petals of certain flowers, from where the bees gather it and store it in the combs of their hives.

All seeds are composed of starch, principally, hence the large amount of this grape-sugar syrup which we call honey. But what becomes of this waste after the new seed has been formed, and gone to work performing the same function as the leaves until it reaches maturity? The seed will not receive it, the leaves will not take it, for they are taking it in its first form (carbonic-acid gas). Then what is to become of this vast amount of nectar? In the humid regions it is washed away by the dews and rains; in the arid or irrigated sections it falls off the plants with the dry mature flowers, and is gone unless it is saved by the bees. The honey-dew on leaves, and the honey on the petals of the flowers, are governed by the same law; that is, the exudation of the excess that remains after this infant seed, leaf, or stem has been supplied with the quantity required to start it to work for itself.

We said above that plants or trees that produce no seed ever discharge any of the syrup which we call honey, such as the rose, snowball, and many others. The sugar derived from the starch stored in the body of such plants is transformed into a gum substance; thence into wood or woody fiber, and added to the plant, forming what we call growth. No method yet applied by scientific experimenters has ever resulted in forcing a plant to imbibe sugar when it has once yielded it. The sugar maple, although yielding a sap heavily charged with sugar, could by no appliances in the hands of the experimenter be made to receive again the sugar. It will imbibe the water when applied to the roots, but rejects the saccharine matter.

In the light of all these known facts, how can the bees, by saving the honey from the spent blooms of plants, injure or decrease their value, when it is known that the spent blooms must fall to the ground with all the honey they may contain, to decay and disappear from man's control? Ignorance of

the value of the honey-bee on the part of many people causes this valuable little servant of mankind to be more persecuted and slandered than any other gift of our Creator.

Some years ago an article went the rounds of an ignorant press, copied from one paper to another from Maine to California, and from Canada to the Rio Grande, accusing the bees of puncturing and robbing the grape of its sweets. But when the truth was learned, the facts proved that the grapes had cracked the skin open, so that the sweets were going to waste, and the bees were doing all they could to save it for man. But the slander had to run its course.

If it were not for this little busy servant we should have to dispense with many of our fruit-orchards, and make out to get along with less than one-fourth part of our alfalfa and other clover seeds. We might just as well say that the bees by gathering the pollen from flowers injure the plants as to contend that their saving the honey injures them. We hope that those who may read this article may see more clearly what honey is, and how it makes its appearance on the petals of flowers and on the leaves of forest trees.

Raleigh, N. C.

CUTTING UP CANDIED HONEY FROM SQUARE CANS.

BY E. R. ROOT.

On page 224 of our issue for March 1, and 276, March 15, I described a method of cutting up a solid chunk of candied honey just as it is taken from the can after the sides, top, and bottom had been cut away. I promised to give a little later some half-tones showing the *modus operandi*. These I now present, showing each step of the operation.

Fig. 1 shows a cake of candied honey after the tin can has been stripped off. This is accomplished by taking a pair of tinner's snips, cutting off the top and bottom, slit ting down one corner, and rolling the tin

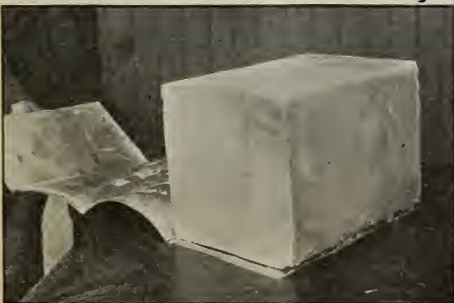


FIG. 1.—CAKE OF CANDIED HONEY SHOWING HOW THE 60 LB. CAN IS STRIPPED OFF.

back, leaving the cake in one solid mass. This is slipped on to a board. An ordinary No. 16 steel wire, tough and strong, is cut into a length of about a yard. To each end is twis'ed on a wooden handle. The wire



FIG. 2.—BEGINNING TO CUT OFF A SLAB OF HONEY WITH THE WIRE.

is slid under the cake, back far enough to cut off a slab of the size desired—we will say in this case 3 inches. The two ends are drawn up on lines parallel to the end of the cake and crossed in such a way as to bring the wire clear around and the honey in the loop formed. The two wooden handles are then drawn from each other, causing the wire to sink gradually in all four corners—see Fig. 2. Continual drawing will gradually pull the wire through the whole mass until it is nearly out—see Fig. 3. The wire is then drawn clear out, but the slab will stick to the main mass from which it was cut. A thin-bladed knife enters the seam where the wire passed through, slabbing the piece off, the same as is shown in Fig. 4. We now have a chunk of honey 3 inches thick, and of the size of an ordinary 60-lb. square can. It then can be cut up into smaller chunks, or “bricks,” as we prefer to call them, as shown in Fig. 5. When this picture was taken, our Mr. Warren had not gotten his hand in as he has done later; but the bricks will weigh approximately 2 lbs., and can be sold by

the piece when wrapped in nice clean transparent paraffine paper. When put up properly they look like dainty toilet soap, and sell—they will move off among your local customers without half trying.

If one wishes to cut honey up into bricks

it, of course; but the honey, by its own weight, squashed down and ran all over everything. The honey should be firm enough to stand up during the operation of cutting, else you will be disgusted with the whole business.

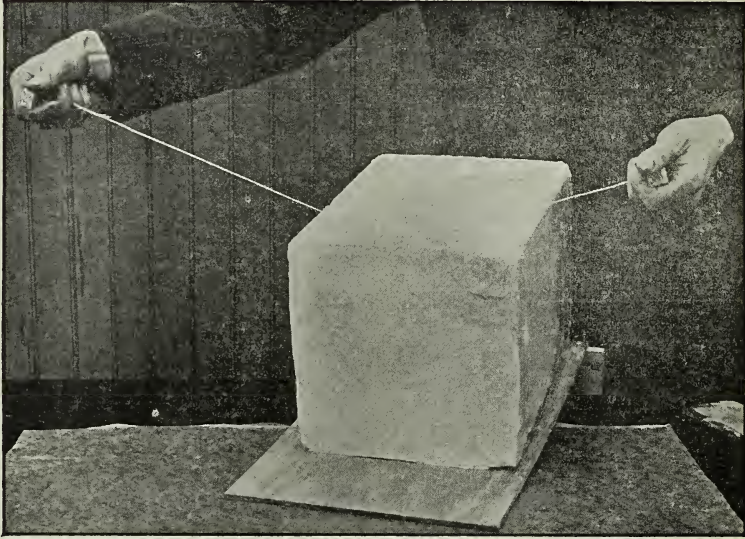


FIG. 3.—SLAB OF HONEY NEARLY CUT THROUGH BY THE WIRE.

he must be careful to select a can in which the honey is not mushy nor soft, but hard and unyielding. This he can easily determine by unscrewing the cap. In our early

As I have previously explained, where an electric current can be procured to heat the wire the cutting can be performed much more easily, and the slabs or bricks will be

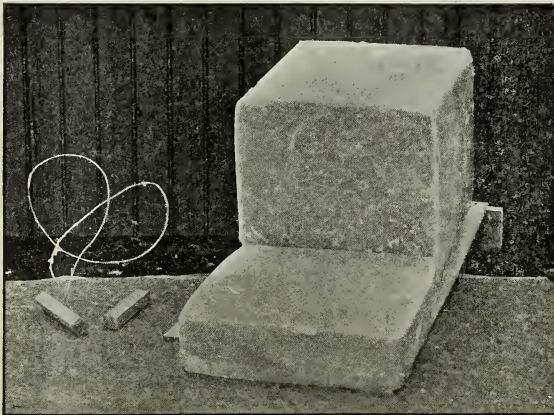


FIG. 4.—SLAB OF HONEY CUT OFF.

experiments we made the mistake once of peeling the tin off from a cake of honey that was semi-soft. Fig. 6 shows what kind of a mess we got into. The wire went through

as smooth and perfect geometrically as one can desire.

It is not too late in the season to try the experiment with cans of solid candied hon-



FIG. 5.—SOLID CAKES OF CANDIED HONEY CUT UP INTO TWO-POUND BRICKS WITH A WIRE.

ey. In the old way, such honey in a square can requires an immense amount of work to get it into shape to sell to the local trade. The cans must be set in boilers of water not hotter than 150 to 160 degrees, and kept there for hours at a time. The amount of fuel required to melt these solid chunks is quite an item; and it is not easy to pour the honey out of these cans after it has once melted. There will always be a draining that is practically a loss.

Perhaps it may be objected that it is too bad to cut up a good square can, and spoil it. In order to carry out this method of retailing in bricks. When it is remembered that a second-hand can brings only a few cents, one can well afford to spoil one if he considers time, labor, and fuel any item—especially so if he can double on his money. This he can easily do if he makes the bricks small enough.

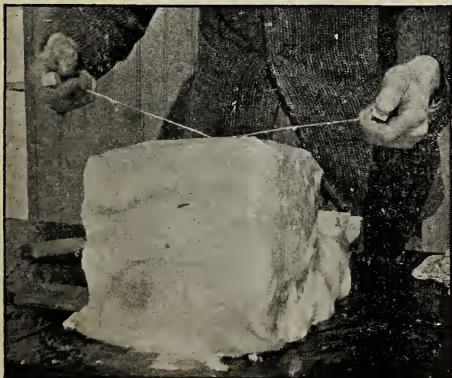


FIG. 6.—CANDIED HONEY TOO SOFT TO CUT UP INTO BRICKS.

STANDARD SIZE OF COLONIES.

Shall we Unite in the Spring? Some Seasonable Teachings on Preparing Colonies for the Harvest.

BY G. M. DOOLITTLE.

The following questions have been sent to me, from which it is desired that I make an article for GLEANINGS:

"How many bees should each queen have in the spring to be in the best condition for the honey-flow from white clover? Would it be profitable to bring all to some standard of strength in spring by uniting?"

I will commence by answering the last question first. I have never found the uniting of bees in early spring as profitable; and from past experience it would be an impossibility to obtain a "standard of strength" in that way. There is something about this uniting of bees in early spring that I never could fully comprehend. It would certainly seem that, where two or three weak colonies were found in April or early May, if the same were put together so as to form a single colony with the maximum number of bees for a good strong colony at that season of the year, a colony so formed would keep right along, the same as does a colony of the same strength in bees that needed no help; but such is not the case. I have tried it scores of times, as have many others of our best bee-keepers, only to find that at the end of a month such colony of united bees would be no better than would *one* of the weak colonies that had been left entirely to itself. For this reason I have, of late years, not tried to build up colonies which came out weak in the spring by uniting the *bees* by any of the known plans, but treat them as will be given further along.

We are now ready for the main question, "How many bees should each queen have in the spring to be in the best condition for the honey-flow from clover?"

That will depend something upon the queen. If the queen is a good one, one that is capable of laying 3000 eggs every day for three weeks in succession, such a queen does not need as many bees as does the queen that is not so good, or the one that will not lay more than from 1500 to 2000 eggs daily during the time specified. And the latter-named queens will not give as good results in honey as the former, no matter how many bees they may have in early spring. With a queen of the first class, I much prefer the colony which has a five-range cluster on a cold morning in early April to one which has a greater number of bees. And what do I mean by a "five-range" cluster? I mean any colony which shows bees between six combs, or in the five spaces which are made by the six combs, the bees in the center space nearly touching the sides of the hive, and coming nearly down to the bottom-bar to the frames, on a cold morning in early April, the same being found in this way on tipping up the hive from the bottom-board, and before the colony "breaks cluster" from the disturbance of the tipping. The clusters in the spaces on either side of this center space will not be as large as the center one, and the two still further out are still smaller than those nearest the center. If I have made this plain (and I think I have) I will say that, in Central New York, that size of cluster will give better results than will a cluster either larger or smaller, according to an experience of over 30 years; and if I could have each colony in the whole apiary in that shape, I would ask for nothing better. Such a colony I consider A No. 1 in every respect, if it has a good queen and a reasonable amount of stores. I used to think that, where I had a colony at this time of the year (first of April), that had bees in from eight to ten spaces, as I sometimes would have with large colonies when set out of the cellar, I had something that would show a great record in honey; but such large colonies have never produced the honey that colonies of the five-range clusters have done from clover and basswood. I have had these large colonies fill their hive with brood in about four weeks from the time of setting from the cellar, and it seemed that they would do great things when the honey harvest arrived; but soon the queen would cease her prolificness to a great extent, or just at the time she should be laying the most profusely in order to bring the largest amount of bees on the stage of action at just the right time for these bees to take advantage of the clover-honey harvest. If it was honey from the fruit-bloom that gave us our main crop, then these large colonies in April would be just the thing; but a surplus from this source, to amount to any thing as a marketable product, is something which does not

materialize once in a dozen years. With the five-space cluster the bees arrive at the maximum amount of brood-rearing in just the right time for the bees from that brood to become laborers in the harvest from clover, and that is the reason that a cluster of this size is the best.

But what about those which have a smaller amount of bees than a five cluster? These are not united, as I have already explained; but as soon as any of the large colonies have frames of brood from which the young bees are just beginning to emerge, such a comb of this emerging brood is taken and carried to one of the colonies which was only a four-space cluster, and an empty comb or comb of honey (according as they have stores) is given to the strong colony. This helps both colonies by bringing each up or down, as the case may be, to the place which the five-space colony now occupies. In a week or so, another frame of emerging brood is taken from the strong colony and given in the same way to the colony which was still weaker in early spring, or the three-space cluster; and in still another week, another frame is taken from the strong one and given to this same three-space colony. In this way the strong colony is brought, as nearly as may be, to the condition of the five-space colony at the time of the clover harvest, and the three and four space colony comes up so that they nearly equal the ideal one, which had five spaces occupied with bees in early April.

In my earlier bee-keeping I used to bring the two-space cluster up in early June by giving it a comb of emerging brood from two or three of the now complete colonies; but since I learned more of the "shook-swarm" plan I consider these very weak colonies of nearly as much value as one that was fairly good in the spring, using them to care for the brood from which the swarms are shaken, as I gave in the "Conversation" found in the February 1st issue of GLEANINGS for this year. This bringing of a colony up to its maximum strength in bees in just the right time for the honey harvest may be a hobby of mine; but I found, by careful watching for years, watching to find out why it was that certain colonies in the apiary did so much better at honey-storing than did others, or, in other words, what it was that made certain colonies "lucky colonies," as it was termed, that it was just this thing of having the maximum amount of bees on the field of action, just when the harvest was at its best, that gave these "lucky" yields; and as twenty years' experience along this line has given the same "lucky yields" every time, I am still riding the same old hobby; and allow me to say that it is just the *best* hobby any bee-keeper can ride who is depending upon the honey yield from his apiary for his success. If I am correct, Mr. A. I. Root and Dr. Miller do not discountenance the riding of hobbies, and claim that the man who never has any hobby is not much of a success in the world.

Right here I wish to correct a wrong impression which has gone out, as it would appear from the writings of S. E. Miller, who advocates the "keeping of colonies always strong," and reasons, somewhat, to the effect that Doolittle was advocating weak colonies at all times of the year, only just at the honey flow or flows. This is not what I advocate in the expression "colonies having the maximum strength of bees when the honey harvests are on, and as weak at all other times as is consistent with this object." That five-space cluster spoken of in this article is as weak as I would ever have any colony, if I could have my way, and is as weak as is "*consistent*" with securing the maximum amount of bees in time for the harvest, as I have already shown. All York State bee-keepers know that any colony which has a five-space cluster on the first day of April, as I have described, is a good colony of bees to all intents and purposes. In fact, I never do any thing to discourage any colony in the least, only as I have given in the above in making the extra strong help the weak; but I *do use my utmost endeavor* to find out just when the main honey flows may be expected in my locality, and then work with all the *vim* that A. I. Root does with his automobile, to bring all colonies up to the greatest possible strength in *field-bees* just when those flows are at their best.

In this article I have given (in part) some of the means used to effect the object I desire to accomplish. I ask no one to use my methods unless he can see it to his advantage to do so. I simply say that, if I have attained any success in the pursuit of apiculture, it has been obtained by the use of the means I have given from time to time in the columns of GLEANINGS.

Borodino, N. Y.

LANGSTROTH INVENTION OF THE BEE-SPACE.

The Might of Right, and How Truth Must Prevail;
an Interesting Historical Sketch.

BY C. P. DADANT.

Mr. Editor:—I have just read with great interest the inquiry of H. J. O. Walker, of Leeford, Eng., and your reply to him concerning the invention of the movable-frame hive. As you mention my father, Chas. Dadant, going over this subject about 1886 or '7, I wish to say a few words, for the discussions took place mainly in 1870-'72, when I was already old enough to take an interest in it. It was in the *American Bee Journal* for March, 1872, that my father took the initiative of the vindication of Langstroth and his invention. In an article entitled "Honor to whom honor is due," he stated what knowledge he had of the inventions of European bee-keepers in the matter of movable frames. He had tried the Debeauvoys hive and similar hives in France before coming to America, and could say knowingly that the Langstroth hive was the

only practical hive, since it was the only hive which had, as you very correctly describe it, "a bee-space around the frame—top, sides, and bottom, and a bee-space between the frames, the same supported by a projection or a continuation of the top bar." In this article he quotes Hamet to show that the Debeauvoys hive had so little practicability about it that the 2500 proseytes which this hive had gained in France very soon abandoned it and returned to the old straw hive. The hive worked well when new; but as soon as the frames had been propolized it was no longer a movable-frame hive. He quotes Bastian and Mona to show that the Berlepsch hive, which came the nearest to the Langstroth invention, but did not have the movable ceiling, was also a failure.

At the close of this article he says: "I do not know whether these facts can have any influence on the lawsuit now pending, but I owed to Mr. Langstroth, I owed to truth, I owed to the history of bee culture, the publication of the above facts."

This was the first successful step in the vindication of Mr. Langstroth. The Blake hive, described by Buzairies, was most probably an invention which had not found its way in print in America, and was used by only a few. It can not be called a movable-frame hive, since there is no statement of the width of the drawers that are placed perpendicularly in the upper part. The brood-apartment was very evidently without frames, the small slats at the top being intended for the passage of the bees. It is quite plain that these upper drawers were intended for the purpose of securing the honey in sections of two or more combs at one time. There is a possibility of others having invented the movable-frame hive at the same time Langstroth did. A. F. Moon claimed that honor, in his "Autobiography and Personal Recollections;" but history must record only that which is evident and beyond dispute. That the time had come for improvements in hives is shown by your statement of the number of patents that were taken after 1831 on this matter. But had not Langstroth made and published his invention, America might have lingered in the rear instead of coming to the front of nations in practical bee culture. There is little doubt that, in France, the Debeauvoys hive with its deceiving features of improvement, was mainly to blame for the reaction against progressive hives that has lasted in that country almost to our day.

You will remember the bitter war that was waged against the senior Dadant by the second oldest bee-journal in the world, *L'Apiculteur*, of Paris, just because he insisted on the practicability and usefulness of the Langstroth principle in hives. From 1869 till 1873 it was a war of harsh words which finally cooled down to a surly obstinacy on the part of Hamet; but the progress has slowly advanced by the repeated efforts of a number of men, and the Langstroth invention is recognized there as well

as here. A young generation has dropped the fight; and a month ago the later and more progressive editor of *L'Apiculteur* decided to open his columns freely to the new ideas, and asked for apicultural contributions of the son of the man who had once been reviled by this same paper for his views.

Hamilton, Ill., Feb. 24.

[Yes, indeed, your most respected father was persecuted for telling the truth; and it is pleasant to know that time has fully vindicated him, in the very journal that opposed him so strenuously. It seems, though, as if nearly all good things must be opposed at the beginning. A recent example is the plain section and fence, both of which are coming more and more into use. The Italian bee was opposed on its first introduction, and at one time your father and Langstroth were almost their only defenders. There are numerous other examples that might be given if it were necessary.—Ed.]

CHEAP HOME-MADE WINTER-CASES.

BY F. GREINER.

One of the problems at the present time before us bee-keepers who are in the business for the money that is in it, and for obtaining the means to clothe and feed our families, is, how to get our hives and other fixtures as cheaply as possible. As far as the sections are concerned, of course we

are at the mercy of the manufacturing concerns and lumber-dealers; but when it comes to winter-cases for the protection of our bees, we can often pick up boxes at the dry-goods stores very reasonably, which will answer well for packing single-walled hives. The two boxes in the center of the large photo were originally one, and cost me 40 cents. It was cut into in such a manner as to give sufficient room for placing, in the back one, four hives (two side and side, and two high), in the front one, only two hives side and side. Two covers had to be made and covered with roofing-paper. To hold them from blowing off I have just piled the hive covers on, which, with the snow and all, has proved sufficient.

At the extreme right of the picture is shown another manner of using up odds and ends of lumber for winter cases. I had a number of large boxes lying around, in which fruit-trees had been shipped. These were worked up at leisure hours. Originally the box shown was intended for four colonies, but is used now for only two. I should have made it a little higher, and put in the hives two high. This would have been cheaper and just as effective. As will be seen, I have made use of the four regular telescope hive-covers as the roof for the box, just adding a ridge-board.

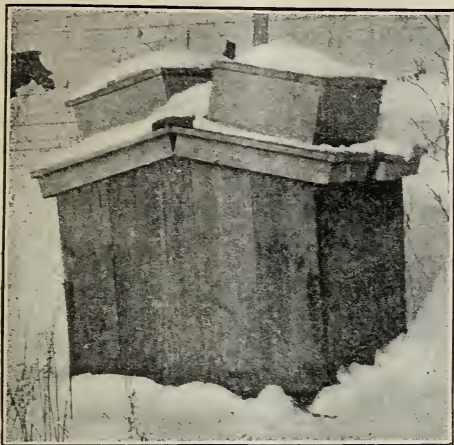
The two hives in the foreground are protected only with tarred paper and a heavy packing over the frames.

The hives shown in the picture are located in one of my out-wards.



A PART OF GREINER'S OUTDOOR-PACKED BEES.

I have been wondering for some time if it were not possible or practicable to use straw in the building of our hives, and thus save in part the expensive lumber. Perhaps straw in combination with paper might do.



GREINER'S HOME-MADE WINTER-CASE.

Straw can be raised quickly on demand, and it would seem that the American genius could contrive a practical method of utilizing this material. It is most excellent material for hives, and, as is well known, has been used for centuries in this construction by European bee-keepers. It seems to me that it is well worth the while to devote some study to this subject.

I have no doubt that hive bodies, covers, floor boards, etc., could be made from pulp—all in one piece, without a seam; but they might be more expensive than even pine lumber. Who can tell us about it?

Naples, N. Y.

[So far straw board is very much more expensive than pine lumber. The time may come, however, when we can use some material made of straw. This article was written during the early part of winter. It will be interesting to know how the bees come out.—Ed.]

A CHEAP, SERVICEABLE, HOME-MADE UNCAPPING-CAN.

Moving Bees in Box Hives; Home-made Hive-covers.

BY E. F. ATWATER.

Take a large-sized galvanized-iron tub; cut out the bottom to within an inch of the circumference, and solder in its place a large circular piece of heavy galvanized-wire screen. This makes the upper part of the capping-can. Now take another tub, slightly smaller, for the lower part, to receive the honey which drains from the cappings. Make four hooks of iron $\frac{1}{8} \times 1 \times 4$

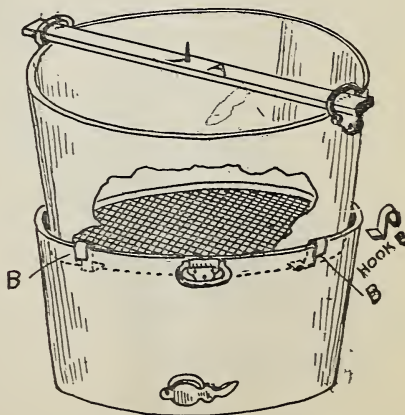
inches, bent in the shape shown in the cut at B. Hang these on the rim of the lower tub so that they will support the upper one. Now get out a piece of clear pine, 1×2 inches, and about 3 inches longer than the width of the top of the upper tub. Drive a large long screw through the center of this piece, and file the point until it is sharp. Raise the handles of the tub, and slip the strips under them. If desired, a honey-gate may be soldered in the lower tub. Such a capping-can is cheap and efficient, especially in moderate-sized apiaries.

HOW TO MOVE BEES WITH OPEN ENTRANCES.

I move bees over rather rough roads, in spring or fall, without springs or hay, and with no loss. I have just finished moving an outyard of 115 colonies a distance of seven miles. Some of the colonies were in old box hives recently purchased; and as it was almost impossible to fasten the bees in, owing to cracks and crevices, we threw a large wagon-sheet over the load and tied it down at the corners. By occasionally pouring a good volume of smoke under the wagon-sheet, which retains more or less of it for some time, the bees are subdued and kept so. This has proved a very useful "kink" to me when moving old hives.

HIVE-COVERS.

About a year ago I described the McClellan hive-cover, which you illustrated in GLEANINGS; using the same principle, I am now making double covers which are light, cheap, and durable. Get out $\frac{3}{8}$ or $\frac{1}{2}$ inch stuff, in one or more pieces, to be as wide as the hive, and an inch or more longer. Nail cleats about $\frac{1}{2} \times 2$ across at each end,

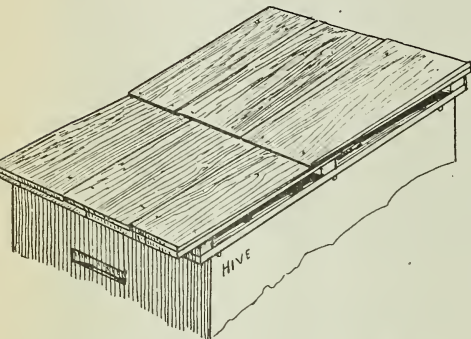


TUB CAPPING-CAN AND PARTS.

and one in the middle. On these cleats nail the best cedar shingles, as shown in cut. If you wish a dead-air space, cleats must also be nailed in the openings at the sides of the cover. Give the shingles two or three coats of good white paint, and your lids will last for years. The material

for three lids costs me about 5 cts. each, without paint. To prevent the cover from sliding off the hive, drive two crate-staples near each end on the lower side, or nail small cleats across.

A splendid cover in some respects is the one used by G. J. Yoder & Son, of Meridian, Idaho. The rim of $\frac{3}{4}$ -inch lumber is rabbeted so as to telescope about $\frac{1}{2}$ inch

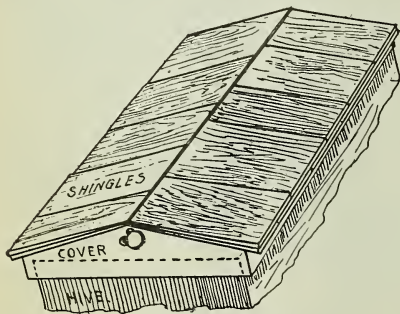


THE M'CLELLAN DOUBLE COVER.

over the hive. The gable roof is of shingles, well painted. There is an opening in each end, for ventilation, which may be closed by a button.

Boise, Idaho.

[Your uncapping-can is a very good one. The only trouble is, the upper compartment ought to be three or four times as large as the lower one—that is to say, the upper tub will become filled with cappings long before there is two inches of honey in the lower one; but in a small extracting business this would not be a very serious objection.



THE YODER COVER.

The plan of moving bees without closing the entrance, or moving them as you describe, where it is not practicable to close up the hives, is perfectly feasible. After the bees have been severely jolted for a few minutes they will not be likely to offer an attack; but the difficulty is to get them jolted to quietness in the first place. A vigorous smoking in the entrances, then a

brisk drive, will put the bees in a quiet condition where they will stay so. It is a well-known fact that in bee-hunting the first blow of the ax on the outside of the log brings the bees out in battle array. If they are smoked back, and then a continuous chopping be applied on the log, they will quiet down without the further use of smoke. The log can be chopped open, combs be torn out, and no stings will be received except where the bees are accidentally pinched.

I believe your covers to be all right.—Ed.]



COVERS VENTILATED OR DEAD-AIR SPACED;
INVERTIBLE HIVES; IS THE GENERAL
PRINCIPLE PRACTICAL?

My attention is attracted by Dr. Miller's remarks in *Stray Straws* concerning covers. He says, page 12, "Besides, we want a cover with a dead-air space, so as to be cooler in summer and warmer in winter." I think the doctor is right so far as an air-space is concerned; but if he will make a test of two, one having a dead-air and the other a free-air or ventilated space, he will find that, while the latter will keep the under part cool by the air carrying off the heat from the material over it, the one with air confined holds the heat, which is conducted to the lower part, and thus reaches the interior of the hive. This knowledge has been valuable to me while in Florida, where I spent about five years, and designed and built about one hundred houses, as well as keeping a good many bees, the latter having been my hobby since boyhood—to be more definite, about 25 years. My own experience has thoroughly proved the correctness of the above statements concerning hive-covers. I want to add I fully agree with Dr. M. that a hive-cover is the last part on which to economize.

On page 31 Mr. J. V. Woodworth asks why Mr. Danzenbaker has not turned his brood chamber bottom-up instead of taking out the frames and inverting them; to which you reply that it is not practical with the Danzenbaker hive. I would ask, is it practical with any hive? To me the question appears an important one to bee-keepers, believing, as I do, that many difficulties may be overcome and advantages gained in using a practical working invertible hive. Let me suggest one point. At the beginning of the honey-season, before swarms appear, suppose we invert the entire brood-chamber and put on the super without even opening the hive to look for queen-cells. The brood will then occupy the top edges of the combs; the honey is turned to the bottom of the

hive, and right at the entrance all queen-cells, if any, are upside down. Now, under those conditions what may we anticipate? Having carried the nurse-bee cluster to a position immediately under and very close to the super, is it not quite likely to cause the bees to cluster there, and find the only desirable place for honey being brought in? and is it not equally probable that the honey from below, exposed near the entrance, will be the immediate demand for space above the brood? and what is the effect on the bees in the event of preparations for swarming, after being thus generally upset?

In the event of interference with their plans, and when work is resumed, will not the result be that the brood-chamber is enlarged at the lower edges of the combs, the super occupied, and the conditions so changed as to retard if not to destroy the desire to swarm? I hope others may have some practical suggestions along this line.

Alton Park, Tenn. E. E. STARKEY.

[From 1883 to 1887 the bee-journals were full of articles relative to invertible hives and reversible frames; but after money and time had been expended in getting up devices, and good money had been wasted in patents, it was discovered that very little would be accomplished by turning things upside down, so we hear but little of it nowadays. But individual frames can be reversed, often, to advantage; but beyond the mere building-out of the combs to the bottom-bar, little else is accomplished. Once reversing of a frame is usually sufficient. As our correspondent says, inverting has a strong tendency to disarrange the general plans of the hive; and I doubt if any of those who practice inverting the whole hive have made a copper's more profit per hive than they did before. J. M. Shuck, in the early 80's, got out as good an invertible hive as was ever made. He even went so far as to invent an inverting-jack to invert the whole hive. It performed the operation in a twinkling; but we hear nothing of the hive or the jack nowadays.—ED.]

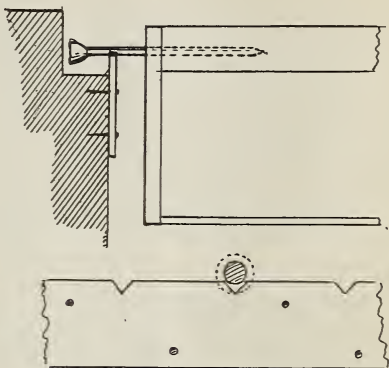
NAIL-SUPPORTED FRAMES; EUROPEAN SILK.

The editor, in Dec. 15th issue, p. 1044, asks for information about frames hung on wire nails. That mode of suspension has been in use in Europe for some 50 years or more, and is known in French-speaking countries as "*cadres impropolisables*," which means unpropolisizable frames. I prefer it to any other. I use 6-penny common or 8-penny finishing nails. The 6-penny finishing are too light. In making the frames, nail the top and bottom bars between the end-bars without any notch, something as shown in the cut.

The figure also shows how the nails rest on the tin rabbets or strips. The tin strips are notched where the nails rest, as shown.

The notches must be very light—just enough to hold the frames in place, and yet permit the apiarist to push them apart if

he wishes to do so, thus securing the advantages of both fixed and loose frames. When the idea occurred to me to cut these notches I thought myself quite an inventor; but I soon discovered that others had preceded me.



GETAZ'S NAIL-SUPPORTED FRAME AND NOTCHED METAL RABBIT.

Heavier nails could be used if needed, 8-penny common, for instance. The danger of splitting the wood can be avoided by clamping the frame in a vise and driving the nail while it is clamped.

RAW MATERIAL FOR THE UNITED STATES SILK-FACTORIES.

Mr. A. I. Root asks, further on, where the silk used in the United States factories comes from. It comes from Southern Europe nearly altogether. The wages there for farmwork is only one-third or one-fourth what it is here; and even that is not to be counted. The bulk of the silk produced is raised by peasants and small land-owners. The work is done chiefly by the women and children, and what they get is counted as clear gain. We can not compete with them. It has been tried several times, and I think there is yet very little silk raised here, in the Carolinas, and one or two other States.

The raw silk, that is, merely reeled from the cocoons, enters the United States free, or perhaps pays only very light duties. On the other hand, very high duties, practically prohibitive, are placed on the manufactured goods. The result is that the silk is imported raw and manufactured here.

Knoxville, Tenn.

ADRIAN GETAZ.

[A nail-supported frame, nails resting in notches, was illustrated some ten or twelve years ago in these columns. The objection to spacing-devices in the hive or rabbet (and a serious objection too, in my mind) is that it does not allow shoving the frames over *en masse* for the purpose of making more room. The shallow notches in your rabbets minimize this objection to some extent.

Another objection to such an arrangement is that it does not permit one to remove the bees to outyards without fastening the

frames. Frames hanging on these nails in notches would swing like pendulums with the slightest movement of the wagon. Nail supports are all right; but the spacing-device should be on the frame.—ED.]

CAN BROOD BE REARED DURING WINTER?

Has any one ever succeeded in raising brood in the winter season by feeding bees carefully and making the conditions right as to temperature? Could a scheme like the following be used? Put the hive in a warm atmosphere, say 70°, and have it rest upon a wire box, say 3 feet high, just the dimensions of the hive, with the bottom so arranged that it could be left out, giving the bees a chance to fly about in the wire cage below, and yet at night gather in the usual cluster.

L. H. CLARKE.

Gardiner, Me.

[Brood *can* be reared in winter, but it is not practicable. You can warm up the hive to 70 degrees; but unless the bees can have a fly in the air outdoors, when it is warm enough for them to do so, and return, they will become uneasy and die off. Some thirty years ago, just within the limits of my memory, my father conducted some elaborate experiments on rearing brood in midwinter. Several hives were shut in a greenhouse, and the glass was screened with mosquito netting. He actually succeeded in rearing brood, and the bees flew out, and in time learned to return; but so many of them were lost trying to get out, that the experiment was deemed a failure. Your wire-cloth box you speak of would be even worse than the greenhouse.—ED.]

WHEN TO TRANSFER.

I have ten stands of bees in old hives, L. frames, different sizes. I have bought new hives, and wish to know when you would transfer—in spring early, or wait and put new swarms in? In the old hives I can not take out frames to examine when queenless or not.

MRS. C. C. D.

Bluffton, Ind.

[I would advise you to follow the Heddon short method, and do the work just as settled warm weather comes on. This method is described in the A B C of Bee Culture, and briefly it is nothing more nor less than shaking or drumming most of the bees out of the old hive and compelling them to go on sheets of foundation in a new hive. Three weeks more, after the brood is hatched out, the old hive is given another shake, or drive, putting the remainder and the newly hatched bees with the first. The old combs are melted up.—ED.]

ROOFS FOR HIVE-COVERS; A FEW POINTERS FROM A CONTRACTOR.

Your article, page 174, pertaining to roofs for hive-covers, and your claim that metal covers of that description are short in service, is true unless you take the best quality of tin and keep it well painted.

That I would consider the best of the metal roofings. Slate or iron roofing is not nearly as good in my estimation. In my practice as contractor and builder I come in contact with almost all kinds of roofing; and of all, outside of shingle, I can recommend only two kinds—that is, for flat-roof purposes. One is the best tin well painted, and the other the Manville asbestos roofing. This roofing, however, is more expensive than other ordinary felt or tar roofing, but still cheaper than tin or good shingle. This roofing will not tear or break, being interlined with layers of burlap, making it thereby very strong and durable. The upper face side is composed of a sheet of pure white asbestos, and guarantee is given that it will stand all kinds of weather for five years without any coating except the cement put between laps.

Speaking of hive-covers, I think this kind of roofing would do excellent service, as it would last a good while without any coating; and after coating, it would be all right for some more years. The price I pay for this material is \$3.75 per 100 sq. ft. here at the store; but each roll contains 200 sq. ft., making a roll very heavy. The nails used for this roofing are purposely made for it, and are furnished with the roll, being flat-headed, no tins required.

WM. F. DANIEL.

Sandusky, O., Feb. 22.

AN EXPERIENCE WITH CANDIED HONEY.

You ask for experience in candied honey. At one time I had a hurry order for five gallons of candied honey. I melted it and put it in a tub, and set it outdoors in zero weather. It thickened, but would not candy. After exposing it for a week I set it in a room without heat, at a temperature of about 4°. In about two weeks more, with some stirring, it candied. Again, I wanted to candy some in glass cans for exhibition purposes. I placed it in an ice-house, laying it flat on the ice and covering it with sawdust. It would not candy at all. This was placed on the ice in August, and taken out in October.

CHAS. MILLS.

Camillus, N. Y., Mar. 9, 1904.

[Too cold a temperature is not conducive to candying. It should be a little above freezing, and change from warm to cold.—ED.]

STINGLESS BEES; ARE THEY WORTH ANY THING FOR HONEY?

Not long ago I saw an item in a paper concerning a new stingless bee. Being busy at the time, I laid the paper aside till I might have more leisure; and when I thought of it some days after I could not find the paper. I did not remember the name or date, but I think it a sample copy of some farm paper. If you know any thing of them, let me know. If not, send me what information you can; for if there is no serious danger of getting stung to death, or the experiment will not call for more expense.

than I can stand, I would not mind making a trial.

I should like to find something that would bring good returns with time, as I have almost no money, and should like to find something that I could live on that would require no physical labor on my part, as I am not strong. I live in the city, close up to neighbors who are cranky about poultry, etc., so no one in the neighborhood could do any thing with that.

MISS M. F. MICHENER.

Burlington, Ia., Feb. 29.

[From a commercial point of view, the stingless bees are of almost no importance, at least at the present time. There are several varieties, or, perhaps, more properly speaking, species, in the West Indies, in Mexico, Central America, and the South American countries. Some of these bees will store as much as half a gallon of honey in a log; but the great majority of them, if I am correct, work from hand to mouth, just about as the native human beings exist in the same localities.

We once had a colony of stingless bees imported from Mexico. Our climate did not seem to agree with them, and they soon dwindled away.

While the stingless bees, as their name indicates, have no stings, yet they can bite pretty viciously. One variety is said to be able to "bite so tremendously" that the average person unfamiliar with the sting of the regular honey-bee supposes he has actually been stung.

You would not find the difficulty from stings of the regular honey-bees so serious as you imagine. Get some practical bee-keeper to show you how to open a hive with a good smoker. Mrs. L. C. Axtell, of Roseville, Ill., has been an invalid for years, yet she manages to do a large amount of work among her bees, and she makes them pay.—Ed.]

FEEDING BACK; WHY NECESSARY TO THIN DOWN THE HONEY AS FED; UNCAP-PING-KNIVES; SHOULD THEY BE USED HOT OR COLD?

Why is it advised to thin down honey with warm water to about the consistency of raw nectar when one wishes to feed back for the purpose of finishing up sections at the end of the season? We have fed back thousands of pounds of extracted honey, and never yet had to thin it down to obtain the results sought. If you feed back such thin feed you certainly have to feed back a greater bulk, and we find it causes the queen to lay, and there is a large amount of brood raised that is of no use to the colony—at least, such is the result in this southern country. Such thin stuff causes the bees to do more work, and they will not finish the sections as soon as they would if they were given thick honey, and the thicker the better.

The question as to which is better, a warm or a cold knife for uncapping, perhaps if the honey is thin a cold knife will

answer very well; but if the honey is thick, then a *hot* knife is the best. We now consider a *warm* knife but little if any better than a cold one. Our practice is to have a suitable pan set on a coal-oil stove, and filled with water kept near the boiling-point. Each uncapper has two knives, one of which is in the water all of the time. We never uncapped more than one comb without changing knives, thus keeping the knife always hot. We hardly think a man could stand it to pull a cold knife all day over combs filled with thick honey. Our best day's extracting was 19 barrels of 32 gallons each; and after long experience we have arrived at the conclusion that for us we want no cold knives. We notice one person says, sharpen the honey-knives with a *file*, making a saw edge on the knife. Will not such a knife tear the comb? We know that a very small nick in the edge of a honey-knife always makes us trouble, and we try to have the edge on our knives as keen as a razor; but we find there is not more than one knife out of three that will take such an edge; however, everybody to his notion. We tell only what is most suitable for us under present conditions. We might change our mind if we were in a different locality. M. W. SHEPHERD.

Marchant, Fla.

[The question-marks put out by our correspondent deserve our careful attention. I should like to see these questions more fully discussed. Since writing the foregoing I have had a talk with Mr. N. E. France, General Manager of the National Beekeepers' Association, and he seemed to agree with every point made by our correspondent.—ED.]

EXTRACTING-FRAMES; WHAT SHOULD BE THEIR DEPTH? PERFORATED ZINC AND WIRES NUISANCES.

On page 25 you are "just shouting" when you say the extremely shallow frames are "too much of a good thing." Two of them are too deep for a comb honey hive (I will say in this locality), and one's on the other extreme, only very much worse, making it necessary to use that other nuisance, the queen-excluder. Really, I don't see what they were gotten up for. The 7½-inch-deep frame is *the* frame to use in a comb-honey hive. It is the only frame I can get filled with brood clear up to the top-bar without danger of the queen going into the sections, and also pollen. No excluding zinc is needed. Full sheets of foundation in these frames make perfect combs without wiring. Go any deeper than this and you *must* wire. Then comes the trouble from getting the wire too tight or too slack, foundation buckling, elongated cells stretched out of shape so the queen lays drone eggs in them. I know this does not always happen, but does very often, as we can see from the complaints that appear in the various bee-papers.

On these hives I use a super of combs 5

inches deep in the early part of the season, and remove them when I put on the sections. Thus you see I have a big hive, 12½ inches deep, when the queen needs lots of room, and a shallow hive (7½ inches) when I wish to crowd them into the supers, and no dummies under outside sections.

W. C. GATHRIGHT.

Las Cruces, New Mex.

FEEDING BEES A POLLEN SUBSTITUTE AND SUGAR SYRUP AT THE SAME TIME.

The food I give my bees is scalded corn meal, baked, sweetened with black Cuban molasses. I then scrape it out from between the crusts, put the same on a plate, and cover it with molasses, and mix it.

MARGARETTA STROUP.

Southampton, N. Y., Feb. 28.

[Years ago this was talked about through the journals, and I succeeded, as some of you may remember, in getting bees to take a mixture of honey and rye flour—that is, early in the spring, before they get pollen. The letter above mentions accomplishing the same thing with corn meal in place of the rye.—A. I. R.]

MOLDY COMBS, ETC.

I should like to ask you how I can prevent molding or souring of honey in the hive, as it seems to in one of mine. Drops of water gather on the covers. Would you keep dead bees from the bottom-board in the cave at this time of year? Will this moldy or sour honey kill the bees? Should I take it out of the hive?

Osgood, Iowa. E. M. THOMPSON.

[The combs referred to in your letter are possibly not moldy in the sense that they are covered with a fungous growth. Combs that have been in outdoor-wintered hives very often show a sort of blue tint as if they were moldy. Whatever this tint is, it does no harm; neither do the drops of water that gather on the covers. Dead bees should be cleaned off from the bottom-boards occasionally.]

If the honey in the combs is actually sour (a fact which you can easily determine by running your finger in the honey and tasting) it should not be used, of course.—Ed.]

HONEY VINEGAR.

I have seen in GLEANINGS that partly filled sections might be made into honey vinegar. Will you please give the process? Winchester, Ind. M. N. BORROR.

[The honey in unfinished sections can be extracted providing it is uncapped. It can then be worked over into honey vinegar by diluting with water and putting in the mother or ferment of an old vinegar-barrel. Full directions on how to make honey vinegar are given in our A B C of Bee Culture.—Ed.]

REPORTS ENCOURAGING

From 15 hives I extracted 6300 lbs. One hive made 443 lbs., and I took from it four frames of brood in May. I bought my queens of J. P. Moore. I never saw such a season before. T. L. SHAWLER.
Silver City, Ia., Feb. 14.

I had in spring 12 colonies of pure Italians. I increased to 30 good colonies, which went into winter quarters heavy with stores, and put on the market 1800 lbs of fancy and No. 1 comb honey—about half fancy and half No. 1. S. S. SCOTT.
Blandburg, Pa., Feb. 10.

I started in the spring with 9 colonies. One had no queen. I bought a three-frame nucleus; made two colonies, and one came to me. I started in the winter with 33 colonies. So far I have lost two. I received 950 lbs. of section honey. W. E. MCFARLAND.
Paris, Mo., Feb. 11.

I started with one colony in March, 1903. bought four more, increased to eleven, took fully 200 lbs. of honey; paid for all hives, including this year's supply, from sales of honey. I have eleven colonies; am waiting for the weather to moderate. JAMES M. PULLEY.
Melrose, Mass., Feb. 6.

I received 1200 lbs. of nice comb honey and about 30 of chunk from 18 hives; spring count, 13; increased to 22, but caught four or five stray ones. I had seven colonies that never tried to swarm. They made me about 120 lbs. each. I caught a swarm June 28. They filled an empty hive and four supers with nice comb honey. J. C. LUGINBILL.
Humboldt, Neb., Feb. 6.

A BEGINNER GIVES A THREE-YEARS' REPORT.

When I started with bees I knew nothing about them (except that they gathered honey, which I like, and would sting, which I did not like). June 26, 1900, I bought a swarm (just came out that day). Result for 1900, comb honey, 24 lbs., and brood-nest full, no increase, no care.

I started in 1901 with one stand; increased to four; one got away; surplus comb honey, 63 lbs.

In 1902 with three stands I increased to 11 (sold one); comb honey, 79 lbs., or 26½ per stand, spring count.

I started 1903 with 10 stands; increased to 21; result, comb honey, 700 lbs., or 70 lbs. per stand.

I winter on summer stands in rough boxes stuffed with chaff; lost none in winter yet.

Long Rapids, Mich. RULAR THORNE.

\$500 WORTH OF HONEY FROM 19 COLONIES, SPRING COUNT, ETC.

This has been the best season I have had in 25 years' experience. From 19 colonies, spring count, I find by my book I have sold over \$500 worth of honey. I am all sold out; all sold in my home market. I attribute my success partly to giving empty comb, or full sheets of foundation. Many a step could be saved by the amateur if he would adopt my plan. My hives are all covered with galvanized iron, making a very handy place to write the record on. Every time a hive is opened I set down the date and the exact state of the progress in each super; also other things that I may know about them. This saves a vast amount of work. We had a wonderful flow from white clover, but very little from heartsease or smartweed. Generally smartweed is our best flow, lasting until frosts. Basswood did not blossom at all. My bees all flew heavily Feb. 5 and 6. They have consumed a great amount of stores. I never saw the like. I fed 25 lbs. to the colony last fall, expecting them to come through heavy. I must feed in March again.

I saw a criticism in the *American Bee Journal* about the Hoffman frames. I got 25 Root hives last fall. I think the end-bars should be ½ inch thicker. I cut all my brood foundation so as to leave ¼ inch at the ends. I have to waste ¾ inch on every sheet, but I never have any buckling, and never have seen drone of any amount built on it.

Marceline, Mo. Jan. 7.

IRVING LONG.



Whom the Lord loveth he chasteneth, and scourgeth every son whom he receiveth.—HEB. 12 : 6.

From a recent editorial in the *Sunday School Times*, under the heading "Ought we never to be sick?" we make an extract as follows:

But God, who is love, is to-day blessing some lives with disease. Through the door of illness he is pouring treasures into the lives of some of his trusting children, without which those lives would be poverty-stricken in comparison with their present wealth.

I read the whole article over several times. It is a reply to a correspondent who thinks the editor of the *Times* does not give sufficient credit to the subject of divine healing. Dowie has been saying, you know, that all sickness is of the Devil, but the position taken by the *Times* presents a pretty strong contrast; and I confess it was, at least to some extent, a new thought to me that God is sending blessings through sickness, pain, and disease. Failing health has certainly made many changes in my life. It has often brought me to a standstill, and forced me to give up planning for larger and greater business. It has sent me out into the world, away from home with its cares and surroundings. It has put me on my good behavior, and made me gentler and kinder, a better husband, a better father. When one is traveling, especially when he is an invited guest, he is *obliged* to be pleasant and good-natured; and so far as I am concerned I am inclined to think the *Times* is at least partly right—perhaps entirely so. Permit me to say that, among all our religious periodicals (and I look over a large number), there is not one that takes a higher stand, morally and spiritually, than the *Sunday School Times*. Let us now go back to our talk in the last issue.

The quiet home life that Mrs. Root and I both enjoy so much was suddenly broken up. There were two nurses and a hired girl; and before we got through there were several doctors. The fever was soon broken up; but Mrs. Root was left very weak and feeble. Yes, in just a few days she was a nervous wreck compared with what she had been. When the first trained nurse came she instituted a new order by way of stillness and quietness. The first thing she asked for was an oil-can. When I inquired what she wanted it for she said there were several doors with "squeaky" hinges; and when Mrs. Root was asleep, it was actually a matter of life and death to avoid every thing that could possibly disturb or awaken her. The serious problem at this time was to get her to sleep and *keep* her sleeping. We were obliged to resort to hypodermic injections of morphine; but the physicians and nurses all declared this was to be only a last resort. I got the oil-

can, and volunteered to fix every hinge so there should be no squeak. Pretty soon I was told to go around in my stocking feet or get some different shoes. To be frank, there was some talk of sending me away in order to have things quiet. Now, doctors and nurses are all right; but I knew, and Mrs. Root knew, that it was a settled thing long ago that, when either one of us passed through sickness or went down to death, the other was to be constantly near. Of course, I reformed my noisy ways. I telephoned our shoe-dealer to send samples of the best shoes he had in stock, to be worn in a sick-room. There was one pair all felt—felt soles as well as sides; and I have worn them every day from that time till now—nearly three months. These shoes have been such a blessing to me (as well as to Mrs. Root) that I wish to stop a little and talk about them.

Heretofore, every winter ever since I can remember I have been troubled with corns and chilblains. After I had worn these soft porous shoes a week or two my corns and chilblains began to disappear. Not only that, the thick tough hard flesh or skin that has been the growth of years, on account of wearing hard leather shoes, has gradually disappeared, or been scrubbed off when washing my feet with strong soap and water. Some time ago I told you about having trouble with my feet burning. Two or three years ago up in Michigan my feet burned so badly that I walked on snow-drifts by the side of the road in my bare feet to go to Sunday-school. I even stood in *ice water* in order to cool them off. When spring comes I almost always have trouble of this kind. You may remember I told you that our family physician said my feet did not have ventilation enough—they must have a chance to breathe; and he advised low shoes that would lace down to the toe, or nearly so. That was years ago, and I have worn laced shoes ever since. Well, now, these felt shoes are away ahead. The air can pass in and out on every side, even through the soles. Of course, I can not go out in the wet with them. When you step out you must have overshoes with rubber soles, for protection from snow and wet*; and since my feet have got well they are almost never cold. I wear woolen socks with them, and the wool causes no inconvenience, as it formerly did, because of the abundant ventilation. Let us now go back to the sick-room.

With these felt shoes I could go all over the house day and night, and I at first approached so silently that I frightened the nurse, and once almost gave Mrs. Root a serious fright. You see her nerves were

* One of the great troubles here in our clay country around Medina is cleaning carpets and keeping the house free from dust. Nothing annoys Mrs. Root more than to have people come into the house and march straight across the carpet with muddy feet. With these felt shoes that can not be worn outdoors, rubbers or overshoes of some kind are a necessity, and, as a result, I always step on the carpet with clean feet. Perhaps I should add, "Or at least I am expected to do so."

terribly unstrung. However, she very soon learned to expect about so often an assuring touch from me, even if I did not speak, or when she was scarcely able to speak. I know it helped her to be reminded that I did not forget her even for one moment.

For almost *two weeks* she ate nothing, or almost nothing. Finally, when a little appetite began to come, every thing distressed her so we were all puzzled to find something that would give nourishment without giving great distress. Her digestive apparatus was left in a fearful state. The morphine injections, which I suppose *had* to be given to quiet the nervous spells that threatened her life, very likely helped to get the digestive apparatus out of tune. The doctors all agreed that morphine is very destructive to digestion. I discussed this matter of opiates with different physicians of prominence; and, so far as I could learn, they are almost a necessity in some stages of disease. In fact, there were times when I think Mrs. Root might not have rallied without the assistance of the quieting influence of a little morphine. She and I both feared that she might get her system in such condition she could not get along without it. The doctors and nurses agreed, however, that there was no possible danger with the small dose ($\frac{1}{2}$ grain) we gave once (and very rarely twice) in 24 hours. When we discontinued its use entirely she missed its effect only a little during one night. After that, there was no trouble. I think there is little or no danger unless it is used immoderately by inexperienced people.

The question of brandy also came up, Mrs. Root and I both object to it, even in the sick-room. We have objected to it all our lives, and do yet; but the physicians and nurses were so sure it would be unsafe to dispense with it, we yielded to them. She took quite a little brandy—of course, in small doses. We both watched its effect; and it is her firm conviction now that she would have got along quite as well without it, and I entirely agree with her. I know it is a somewhat serious matter to disagree with experienced doctors and trained nurses, and we accordingly submitted to them; but after getting all the light on the subject we possibly could, and after weighing the matter not only carefully but *prayerfully*, we are both satisfied in our own minds that there is no need of brandy in the sick-room. I am glad to know there are physicians, and prominent ones too, who stand right with us in this. One of the physicians on the Ohio State Board of Health declares there is no need of intoxicating liquors in treating the sick. When one of the nurses ordered a bottle of whisky, without my knowledge, I sent it back to the drugstore. It *may be* that brandy is sometimes needed, but when it comes to prescribing whisky I draw the line. When I spoke of sending it back somebody said, "It would be handy to have in the house." Now, it is *not* handy to have whisky in our house, and, thank God, it never will be

while Mrs. Root and I live to manage things—and, for that matter, brandy either. The brandy that was left has been made into camphor.

TRAINED NURSES.

It was a great privilege to me to get acquainted with two up-to-date trained nurses. One of them was educated in Cleveland, if I am correct, and the other recently graduated in Boston, Mass. In the first place, their teachings were in perfect harmony with each other; and one prominent characteristic of both was their demand for plenty of ventilation and outdoor air. Even during the zero weather there was a window or two open a little almost constantly; and it rejoiced my heart to see how up-to-date they were in all sanitary improvements. Few doctors, so far as my experience goes, watch every symptom as did these nurses. Any change in pulse, temperature, or breathing, was noted on a paper chart. They knew all about the action of the bowels, the operation of the kidneys, and every phase of the disease was carefully studied. A trained nurse must be strong and well. Indeed, she would not be a very good advertisement for her business if she were not strong and well. They must be ready to take charge of any patient, no matter if he has smallpox, cholera, yellow fever, or anything else. They must be strong physically to handle a patient, and they must be sufficiently gentle and skillful to handle him without giving him pain. I thought I could handle Mrs. Root without hurting her; but I soon had to admit that I hadn't the skill (even if I had the strength) of a trained nurse. These nurses know all about doing every thing that can be done to make the patient feel easy and give him sleep. They know all about hot-water bottles, poultices, plasters, how to put them on and take them off.*

After Mrs. Root had been several weeks in bed she became very sore, especially at the time when she was on her back all the time and could not be turned, even on her side. The nurse advised a rubber bag inflated with air, with an opening in the center. This opening is to be put under the portion of the body that has become sore from touching the bed; and then the bag is inflated just enough to be comfortable. I thought they carried the matter of daily bathing a little to excess, but perhaps they

* It was a happy surprise to me to find out that these trained nurses were perfectly sound on Electro-poise, Christian science, absent healing, and every thing of that sort. Of course, they had both seen many startling cases of patients that were miraculously cured, apparently, by all of these agencies; and they are well aware, too, of the wonderful effect that the mental state of the patient may have over even acute troubles; and I fear right near I have omitted to say that the nurse must necessarily be bright and cheerful. No matter what worries and troubles her, she must be ready to cheer, brighten, and encourage, and, if it is possible, get the patient to laughing. One day I was almost frightened to hear Mrs. Root's ringing laughter once more. I was afraid it might be hysterical; but it was only a laughable story from one of the nurses. Perhaps I should say we had two nurses at once, for only a short time.

were right. They kept the patient as clean as soap and water could make her, from the top of her head to the tip of the toe. I was inclined to think clean water was good enough to wash with; but the doctors and nurses insist that alcohol possesses great virtues for bathing the sick. This may be true. I do not feel inclined to quarrel with them so long as they use it only externally.

WHAT SHALL WE GIVE THE INVALID BY WAY OF NOURISHING FOOD?

At a certain stage of Mrs. Root's disease, I for one began to fear she might starve because we could find nothing that would stay in her stomach, or that the bowels could digest. Somebody recommended the juice of oranges. I felt a little fearful at this; and when it caused such bloating and distress that it almost stopped her breath, I was much more alarmed. She had been getting along so well that our regular family physician ventured to take a trip into another State. He expected to be away only a little more than 24 hours; but soon after he was gone her distress became so great that we called in a young army surgeon, who had been a schoolmate of Ernest's, and who had recently returned from the Philippines. In the doctor's absence he kindly consented to advise us. He said she would have to be relieved immediately of the accumulation of gas in the bowels. The nurse had tried the usual injections, but without relief. He suggested that she try "milk of assafoetida." This succeeded when every thing else failed, and in a few minutes she passed from acute suffering to entire relief. Then we discussed the matter of nourishment. Beef tea, malted milk, malted nuts, and many other things were tried, but they did not answer at all. They either produced the dreaded gas or else they would not stay in her stomach at all. Finally one of the nurses said that we should have to feed her on scraped beef. We got the best round beefsteak in the market, then the nurse scraped it with a dull knife, getting only the pure lean meat without any gristle, fiber, or fat. This was then broiled over a bed of hot coals, and there was rejoicing throughout Rootville. She ate this scraped meat with a relish, and it digested all right. Those who have read GLEANINGS for a few years back will remember how much has been said in regard to the fact that lean meat digests entirely in the stomach, and will keep a patient alive without any distress in the bowels whatever. She lived on this scraped meat until her digestion became strong enough to use beefsteak ground in a meat-grinder, such as can be found in almost any hardware store. Let me digress a little.

During my spells of ill health for almost twenty years past, I have been more or less on the lean meat diet. Ernest and other members of the family have also been obliged to resort to it. Mrs. Root has cooked beefsteak for myself and for the children through all these years until at times it

would not be strange if she hated the sight of it. But she has never eaten any of any account herself. She has sometimes laughingly boasted that, although almost a vegetarian, she was the healthiest one in the lot. I confess I was pleasantly surprised to find that, when she was almost down to death, the beefsteak diet brought her up when it is highly probable she could not have lived without it.* Dr. Lewis, of Cleveland, the present advocate of the lean meat diet, kindly came down to see her, and gave us some very valuable suggestions. For instance, she had neglected the hot water, a pint or more to be taken just before going to bed, and an hour or more before each meal. This was a great help to her. Although she is eating every thing at the present time, she still holds on to her pitcher of hot water. I am quite sure a pint or more of hot water taken as above would be a great benefit to anybody, especially one in poor health. God certainly intended we should have water in abundance, and make use of it, internally and externally. "Wash ye, make you clean."

Let me say in closing what I have said several times before, that my firm conviction is that thousands of people might be living now who died before their time had they known the benefit of a strict lean-meat diet when the digestive organs, especially the bowels, are unable to digest and assimilate vegetable foods. Just one more thing I wish to add.

In passing through this siege, and in deciding these matters in regard to health for the rest of the world as well as for our own home, I have been constantly praying that God would guide me, and keep me from making a mistake in what I write for the friends who read this department.

Later.—Mrs. Root says, after reading the above, that I must not forget to mention rice. In leaving the meat diet for other things we found rice agreed with her better than any other food. It was first boiled up several times, the water poured off, and then steamed for four or five hours. Thus prepared for invalids, we consider it ahead of the many food preparations now made.

* Mrs. Root had said previous to this sickness, perhaps many times that some people might be able to stand the beefsteak diet, but was sure she could not. Well, when we found by repeated trials there was nothing else that would give her strength and nourishment, she said to me one morning while eating her four ounces of nicely cooked ground meat, "I think, husband, I had better be honest, and confess that, since I have become accustomed to the meat diet, I prefer it now to any other *menu* the world can furnish. And I want to say one thing more. If you should ever be on the lean-meat diet again I shall have more charity for you. You used to say it seemed as if you could not wait until the meat was ready. When I get exceedingly faint and nervous from a lack of rations, it now seems to me as if I could not wait a minute longer." At this time Mrs. Root was having four ounces of ground meat four times a day. Between meals she had a little zwieback; but we had to make the zwieback rations very small, or else we should have had recurrence of the accumulation of gas in the bowels; but after giving the bowels a resting-spell (or almost a perfect rest, for two or three weeks) she gradually recovered her health, and now eats every thing with impunity, just as she always did.



ELECTROPOISE, OXYDONOR, ETC., ONCE MORE.

The Electropoise is considered one of the household blessings here. I put myself through a spell of typhoid with it. I never saw a doctor nor had a dose of medicine. I never lost a fine head of hair, and the five or six weeks' illness cost only the price of the ice used. I could give a dozen cases of other troubles man is heir to, cured by it. We have been using it in our family for nearly twenty years, and consider it one of God's good gifts.

SARAH A. TILLINGHAST.

Morganton, N. C., March 8.

My good friend, I am exceedingly glad you got through the typhoid so well, and without any doctor; and may God help me in my effort to convince you that the Electropoise had nothing whatever to do with your recovery unless it was to keep you quiet and give you faith that all would be well. Let me repeat what I have been saying again and again through GLEANINGS for nearly ten years past: There is no electricity, no oxygen, no sense nor science about Electropoise at all. Furthermore, the wicked men who sell it *know* this. If you will take the thing apart you will find the metal shell is filled with sulphur and graphite, or something of that sort. Some of them contain one thing and some another. But the machine will work exactly as well if you empty out the contents—that is, if your imagination would work just the same. It is not an apparatus in any sense at all. It is only an empty fraud. You speak about the expense of the ice. The manufacturers claim that the cold, or something else produced by this melting ice, passes along that single wire. Your family physician, schoolteacher, or anybody else at all conversant with electricity and science, will tell you the whole thing is ridiculous. Prof. H. W. Wiley, United States Chemist, pronounced it at once pure charlatanism. The back numbers of GLEANINGS will give you any amount of proof of every thing I have said. Before the inventors could get a patent (and it is true they have a sort of patent) they were obliged to admit to the experts at the Patent Office that the device was simply to work on the imagination of the patient. No patent would be granted so long as they claimed thermo-electricity or any other sort, nor so long as they claimed it took oxygen out of the air and put it into the human body. In order to get any patent they had to be honest, at least toward the Patent Office, *for a few minutes*. Then they kept on publishing their fraudulent statements about electricity and oxygen just as before.

Now, if the thing continues to cure you people after the above explanation, all right—go ahead. But, my dear friend, you have unconsciously given us a wonderful revelation; and this fact is being emphasized again and again if the world would only

wake up and recognize it. It is this: Thousands of dollars, and I might almost say millions, are spent for things to cure disease that neither help nor hinder in any way. Probably a greater part of the medicines used have nothing whatever to do with the recovery, for nature makes the cure and the medicine gets the credit. You have given us plain proof that people can get through typhoid fever, and get well, without any medicine or doctor. Many of the best thinkers of the present day are suggesting that people might, many of them, get along better without a doctor—that is, the kind of doctors that are altogether too common. The physician who comes into your home, and looks after the water you drink, the air you breathe, and tells you to keep still long enough to give nature a chance, is all right. May God speed physicians of that class; and where the patient would not be satisfied unless he could have some medicine, because it has so many years been the fashion, perhaps a harmless medicine is all right. It simply takes the place of the Electropoise as in the case mentioned above. May God hasten the day when people may come out of darkness into the light in this matter of helping the sick.



MY ROASTED-CHESTNUT POTATO; SOMETHING ABOUT IT FROM THE ORIGINAL.

I advised you not to plant them, not only because they were hollow, but because most of them rotted badly around the hollow. I started those and the white ones and many others from the same seed about seven years ago. All were soon discarded but the red and white, and now comes the strange part of it. The second year from the seed the red ones grew as large as they do now, and I had about a bushel of them, and not a hollow in them; and such beauties to cook! and such a flavor! But you know about that. The third year they were the same, and we thought we had a bonanza. The next year a little hollow appeared, and grew worse and worse until I sent some to you, when they were so bad I thought it would not pay to raise them any more. May be you can bring them back again to their first excellence. If you can, you will have a prize. I can not understand why they grew so badly, as the others did not on the same soil, side by side. I called them "Pink Beauties," for I never saw a finer sight in the potato line than they were when first dug, stretching across the field like a pink ribbon. If you raise them again, just take a look at them in the row when first dug.

Detroit, Mich., Jan. 20.

BENJ. PASSAGE.

Since friend Passage mentions it, I remember that many of them were disposed to rot around the hollow. It is very strange indeed that they should be all right two years, and then suddenly develop that hollow peculiarity. Will friend Passage tell us if he tested them on different soils? We now discover they have been tested only in Michigan; and perhaps our Medina clay soil may give us some that are not hollow. "Pink Beauties" would be a very appropriate name. When I first picked them out

of the sand, and washed them in clean spring water, I thought they were the hand-somest potatoes I ever saw, and I recollect now the brilliant pink *flowers*. Owing to the accident I have told you about, they were scattered here and there over the field; and when they were in full bloom they were so handsome they might do very well for a greenhouse plant.

SWEET CLOVER FOR ORCHARDS, VERSUS CRIMSON.

Friend Root:—Recently in New York Mr. F. E. Dawley, Superintendent of Farm Institutes, told me he was growing white melilot in his orchards. Every third year he ripens seed, cultivates the ground, and scratches in the seed in the chaff with a weeder. He says seed kept over is not likely to germinate. The other years he mows it and lets it lie as a mulch through fall and winter. He got his first seed by getting in as road supervisor, and letting the wild roadside crop ripen its seed. Very likely some of your New York readers know Mr. Dawley. He said he was getting a reputation for slovenliness in growing weeds, but nevertheless it answered as well as or better than crimson clover. L. B. PIERCE.

Tallmadge, O., Feb. 16.

Tobacco Column.

THE TOBACCO INDUSTRY(?) — DAYLIGHT AHEAD.

You can not imagine the condition of this part of the country where tobacco is almost the sole money crop. We can't sell at any price—every thing tied up. I was thinking the other day of friend A. I. Root's talks, and wondering if Divinity was not going to show us that, in raising the vile stuff, we were committing a sin. In raising it we exhaust our lands. We wear out our strength, and we place upon the market something that is of no value on earth to any one, except merely as a destructive agent, as, for instance, an insecticide. Ask the old gentleman what he thinks of this, and let us hear from him. R. C. HOLLINS.

Hadensville, Ky., March 18.

Now, I am afraid some of the friends will think I am hard hearted when I say, "May the Lord be praised for the fact that tobacco in at least one spot in the world is a drug in the market." Perhaps those who use it will be on my side because it will not cost them so much in the future. But, seriously, it would be strange indeed if it were not true that, with the education and intelligence that now are spreading over the whole earth, clean pure minded people did not begin to think of throwing off this yoke of bondage imposed on us by tobacco. For many years we have been told its use was on the increase. May God be praised if a turning point, or, better still, a revolution, were coming. There are thousands engaged in growing tobacco whose consciences are troubled by it. I have talked with them again and again. I have been told over and over that what our brother says above is true. It exhausts the land and deadens the conscience. In a town not ten miles from Medina, where tobacco-growing is all the craze, one church-member confessed to his pastor that growing tobacco is bad business for a Christian. "But" said he, "there is money in it, and we must have the money." I do not know just what the pastor replied; but I should have answered, "What shall it profit a man if

he gain the whole world and lose his own soul?" And just now it transpires that he not only loses his soul but he fails to gain any thing at all. He wears out the land, and does not get the money he expected.

THE ALMANAC WEATHER-PROPHETS; INFLUENCE OF THE MOON ON THE WEATHER, ETC.

A few days ago an editorial appeared in the *Cleveland News and Herald* to the effect that the U. S. Weather Bureau indorsed the "moonshine" notion—that is, that the changes of the moon influence the weather, etc. At the time I mailed this clipping to the Bureau I inclosed the article which was published in our issue for Jan. 15, in regard to Hicks and his almanac, etc. Now, as some of the readers of *GLEANINGS* still insist that Hicks is scientific, I here give the answer received from the Weather Bureau:

Mr. A. I. Root:—I have to acknowledge receipt of your letter of the 16th instant, inclosing an article published in your journal of January 15, and to thank you for your vigorous arraignment of fake forecasting, which is along right lines.

The statement in the *Cleveland News and Herald* in relation to the influence of the moon on weather is not authorized by any publication of the Weather Bureau.

Very truly yours,

WILLIS L. MOORE,

Chief U. S. Weather Bureau.

Washington, D. C., Feb. 27.

Please notice, friends, that the above comes from Willis L. Moore, Chief of the U. S. Weather Bureau; in fact, the letter contains his signature.

Just a word more in regard to Hicks and his almanac which a good friend mailed me. I have carefully noted the almanac and the weather since that article was written, Jan. 7, and there has not been the least encouragement from these observations to believe that Hicks knows any more about the weather than anybody else. His almanac does not make even a suggestion of the severe winter that is just passed—so severe, in fact, that it scarcely has a parallel. There was not a suggestion in the almanac in regard to the thaw, Jan. 21, that caused such a loss of property and life. If his astronomical studies in regard to the moon and planets, as he avers, gave him any insight as to what the weather for the past winter was going to be, he certainly would have made mention of the severe winter in plain and unmistakable terms; and he would also have considered the sudden rise of temperature for just a few days, after which the winter resumed its sway and continued so till the first of March.

It seems to me the above suggestion, coupled with the indorsement of the Chief of the Weather Bureau, ought to convince any in the pursuit of true science that no man living at the present time can tell any thing about the weather ten days ahead, much less point out what it will be day by day for a whole year.

KEEPING MACHINERY IN REPAIR.

BY A. J. ROOT.

I had in mind putting this article under the head of the Home department; but some might object, and say that the home has not very much to do with machinery. I think it has, however, a great deal to do with it. The kitchen pump is a machine, or, if you choose, the pump outdoors. So is the coffee-mill, the clock, the clothes-wringer, the wheelbarrow, and, I was going to say, the horse and buggy. Even if there is not very much "machinery" about a horse, there is considerable about the harness; and when it gets to the buggy, to say nothing of implements for gardening and farming, I think we shall have to decide that every home in our land might with profit take lessons in regard to keeping machinery in repair.

It really gives me pain when I visit beekeepers or other people, and see machinery condemned as useless when a little care in repairing might have kept it in good order. We have all seen it in fence-corners, occupying valuable room in outbuildings, and sometimes scattered about in the dooryard. The old saying, that a stitch in time saves nine, applies to this matter of repairs, perhaps, more than to any thing else. Machinery gets out of order, or comes to pieces because the bearings get loose; and I do not know but *human beings* get out of order and come to pieces because they are obliged to use rickety, rattling implements. The kitchen pump makes a great clatter when you pump a pail of water, because it is not kept in order. When you have sickness in the family, and the sick one is just getting a little sleep, you may begin to think of these things. Let us take the pump first.

There are two joints in every pump that should be tight and snug—the fulcrum of the handle, and the joint where the handle is attached to the rod of the plunger. Constant use wears these joints. Usually the best remedy is to put in a new bolt—one that fills the holes of all three of the bearings close and tight. If the hole in the single central bearing has worn larger than the two holes in the other piece, the first thing to do is to make these holes all the same size. Bore out the small ones until they are of the same size as the largest one, or nearly the same; then get a bolt or pin that fits snugly in all three. Make it so close when first repaired that it will turn a little hard; but oil it frequently and you will soon have a quiet smooth-working joint. It is better that the rivet or pin be absolutely tight in *one* of the pieces—that is, so the bolt or pin does not turn when the pump is worked. This prevents the rivet or bolt from getting loose or dropping out, and reduces the wear to just one piece of the machine. Now, with a little sewing-machine oil-can close by, you can keep these joints all well oiled. Some of you may urge that this is a plumber's business. Well, if you

have not had experience in hiring *plumbers*, send and get one. Every man who has a home of his own, especially if he is obliged to work hard to make both ends meet, should do his own repairing about home. The long winter evenings are a splendid time to do such work. When I get tired reading the magazines and papers I really enjoy taking my kit of tools and fixing the door-locks, pump, the clothes-wringer, and every thing else that squeaks or rattles, and wears on the nerves of the good wife. Some of you may urge you have not skill in this line. Well, then you had better go right to work and learn. If you have a genuine love in your heart for the dear wife you will soon acquire skill. If you send for a plumber or other mechanic he will tell you your pump, sewing-machine, or something else, is all right, make a big bill, and go off with his tools. When he is well out of sight the machine will go wrong again. If it is the man of the house who does the work, he can watch it and go at it again and *again* until he comes out victorious; and this he sometimes does where the regular mechanics give it up.

A little attention to "bushing" saves a lot of money with all kinds of machinery. Some of you may not know what the word *bushing* means to a blacksmith or a jeweler. Well, it is putting in a tube or a crescent-shaped piece of metal to reduce the size of a hole that is worn too large. When I was a boy, the country was full of wooden clocks. After forty or fifty years' use the holes in the wood became too large, and most jewelers told the owners of the clocks that they were not worth fixing, in order to sell them a new one. We had in this region, however, an ingenious old man they called the "clock-tinker." He invented a plan for bushing wooden clocks. He carried around a bundle of goose quills and hens' feathers. He would cut off from one of these quills a short tube that he could push into the hole in the wooden clock where it had become too large. This could be managed so as to reduce the size of the hole just right. Then the steel pivot in the clock-wheel had an *ivory bushing*, for the quill or the feather is equal to ivory. He said this quill bushing would never wear out, and I guess he was pretty nearly right about it. In any small machine where you want pivots to run easily, and without wear, bush the holes with a quill. Let us now go back to the pump.

Sometimes the hole in the plunger wears oblong or egg-shaped at the joint. The other holes in the bolt may be all right. In this case we will take a piece of metal—brass is better than iron—and file it something in the shape of the new moon so as to fit the enlarged hole, and leave a smaller hole at one side. A neater way is to melt and pour in some babbitt metal to take the place of the metal that is worn away. That is the way they do in machine-shops. Babbitt metal wears better than iron or steel, and makes less friction. See that there is nothing about the clothes-wringer, pump,

or any thing else, that "wiggles." Our clothes-wringer is attached to a stand that holds the tubs; but every little while the up-rights get to wiggling back and forth as the women turn the crank. By the way, my good friend, do you ever help your wife wash just a little while, turning the crank just long enough to see whether every thing she uses is in apple-pie order? If you don't, just try it some day. I think I can say from experience that it will make you happy, whether it makes her so or not. You might give her a kiss after you get every thing fixed all right.

Now, during all of this talk, my friends, I have had my automobile in mind; and I want to tell you something about keeping autos in order. I do not suppose that many of you will ever have this work to do; but the same suggestions will apply to your wagon and buggy more or less, and to all other kinds of farm machinery.

REPAIRING AUTOMOBILES.

Our automobile has been doing excellent service all winter, ever since I wrote to you about it last; but it has been a little too hard for me to turn the starting-crank to get it under way. Huber said, when he was at home during the holidays, that it need not turn so hard; and he fixed it so it started very much easier. Pretty soon it got back into the old trick. One day I decided to study out why it did not start as easily as when Huber fixed it; and after tracing the mischief along, I found a little steel wheel that had got one corner worn off clear round. Its office was to raise a cam on the compression-valve; and the cam had got to slipping over outside of the steel pulley. It did not take long to decide that, if the pulley were turned over so as to have the other side or corner, which was perfect, raise the cam, it would be as good as new. So we removed the pivot and took the wheel out; but, behold, the rivet it turned on was worn almost half in two. When we were on that trip up through Michigan, in that sandy region, we were probably careless about getting oil into this particular part, and at the same time it had been cutting badly. Now, right near this little steel pulley there are *two more* just like it. They operate the valves that let the explosive gas into the cylinder, and then let the exploded gases out after they have done their work. We made a careful examination, and found that the rivets or bearings to these other wheels were worn in like manner. All three were loose on the rivets, and would rattle about more or less. I said they should all be put in good order. The holes in the arms to hold these wheels were reamed out until we could just get a tempered steel pin through the wheels. That made a close tight fit. Then they were well oiled, and put back in their places in the auto. What do you suppose the result was? The machine not only started so easily that any child could turn the crank, but it shot off like a young colt. It seemed to me as if

it gave almost double the power, and it required only about half as much gasoline. Why, I could run over town, up hill and down, without using the "speeder" at all. Hitherto I had been doing most of my running with my toe on the speeder. I had also been able to slow up in passing a team by the spark-lever, without releasing the clutch at all. After these repairs the machine would go right along at a good speed with the spark-lever pushed down as far as it would go.

After succeeding so well with this part of the machine, I began examining the levers in the steering apparatus. I found the joints were very much worn and loose. When it is bad muddy weather, we run the auto up town on the track of the electric railway, or between the tracks. It had been all winter long a hard matter to keep the machine exactly in place. After closing up the joints and steering apparatus, it was no effort at all to run right on top of the rails, even at a good speed. I thought I was not only careful with machinery, but a pretty good hand to look it over; and yet I had been very careless in these two respects. I was not only losing the benefit of what the machine could do, but I was letting it wear itself out by my carelessness. I had been keeping every thing well oiled, but this is not all. You want to be sure that your joints are all tight and snug. As my machine seems to be doing even *better* work now than when I first bought it, I am inclined to think the manufacturers did not have these bearings in the first place as perfect as they might have been.

I know there is a natural inclination to dread getting at jobs of this kind, especially where one is going to soil his fingers, and clothing too, if he is not careful. But after you once get at it, and experience the good results you get from having every thing in good order, I think you will learn to enjoy it. Why, I have of late sometimes almost wished there were some work to be done with my auto, because I so much enjoy working with it. After I have been in the office reading and answering letters until I feel clear used up, I can turn my attention to something that needs repairing; and if I succeed in making the repairs *just exactly to my notion*, I forget all about being tired; and then I do really enjoy helping the world along, by repairing or making adjustments, so that *somebody's* work is easier than it has been heretofore.

RADIUM—DOES IT STILL HOLD OUT?

Yes, friends, it is still at it. The bombardment continues exactly as it did when I first received it; and I tell you it is a wonderful thing to see this radio-activity constantly pouring forth its showers of meteors day and night, week days and Sundays, summer and winter, for ever and ever—that is, so far as we have yet explored the matter.

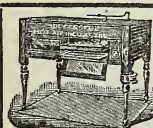


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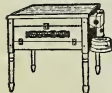
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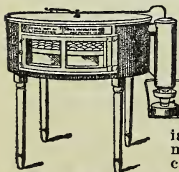
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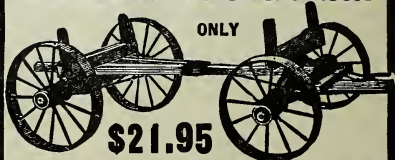
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